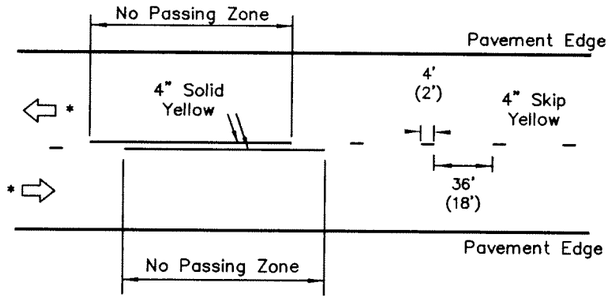
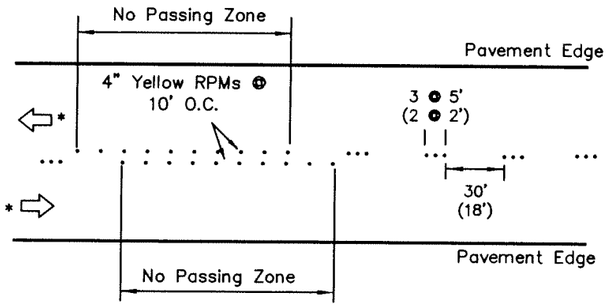


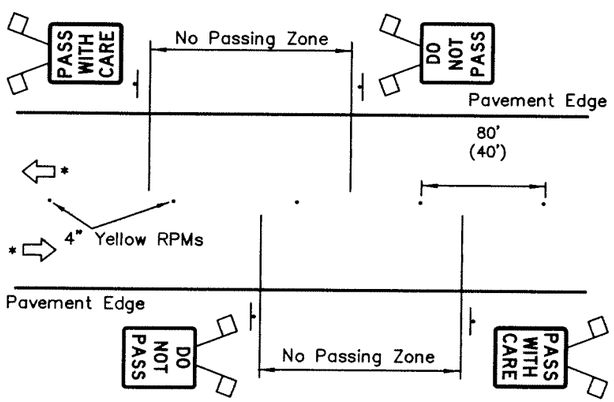
Striping



Temporary Raised Pavement Markers

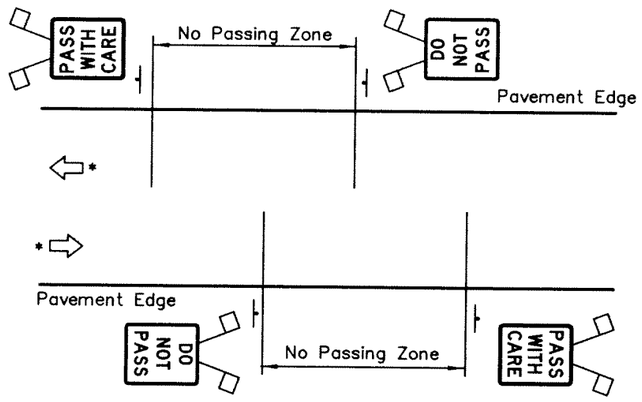
DETAIL A

Two–lane road: No Passing Zones indicated with pavement markings.



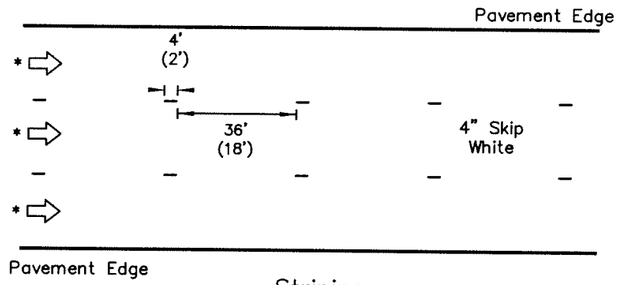
DETAIL B

Two–lane road: No Passing Zones indicated by signs only. Raised pavement markers for centerline delineation.

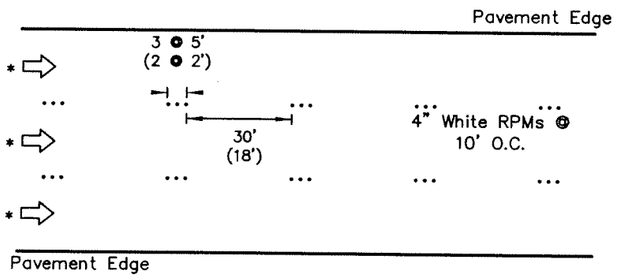


DETAIL C

Two–lane road: No Passing Zones indicated by signs only (see Note 2c). No centerline delineation.



Striping



Temporary Raised Pavement Markers

DETAIL D

Multilane one–way road: Lane dividing lines

* Direction of Travel

GENERAL NOTES:

1. Final pavement markings conforming to Part 3 of the Alaska Traffic Manual should be installed before paved roads are open to public travel. If that is not practical, install interim pavement markings as shown on this drawing. Maintain interim pavement markings until final pavement markings are installed.

2. No interim pavement markings are required:
   a. on projects that will not have permanent markings when finished.
   b. in work zones that are open to public travel for no more than one work shift during daytime or for no more than one hour at night.
   c. where DO NOT PASS and PASS WITH CARE signs are installed on two lane roads as shown in Detail C, no pavement markings are required:
      1) for 3 days if seasonal ADT is above 2000, or
      2) for 1 month if seasonal ADT is below 2000.

3. Interim pavement markings should not be in place longer than 14 calendar days before being replaced with permanent markings conforming to Part 3 of the Alaska Traffic Manual unless the Engineer provides written approval.

4. Where R4-1 DO NOT PASS signs are used, install at the beginning of no passing zones and at no more than 1500' spacings within no passing zones.

5. Install high level warning devices on all DO NOT PASS and PASS WITH CARE signs.

6. Offset temporary markings 8"-12" from the future location of permanent markings if applied on the same lift of pavement.

7. Dimensions in parenthesis apply to curves with a radius of 1000 feet or less or where posted speed limit is 30 mph or less.

REVISIONS		
Date	Description	By
4/28/10	RPM spacing, signs	KJS

Sheet 1 of 1

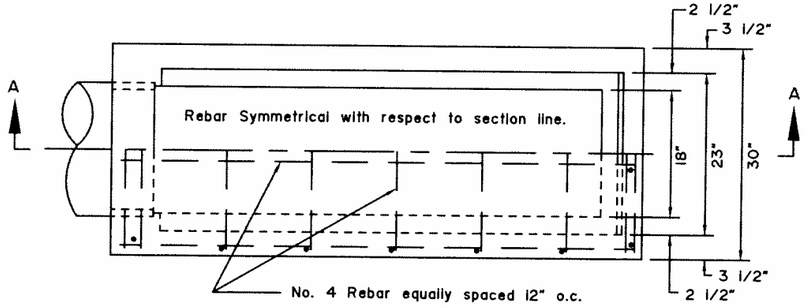
State of Alaska
Department of Transportation & Public Facilities

INTERIM PAVEMENT MARKINGS

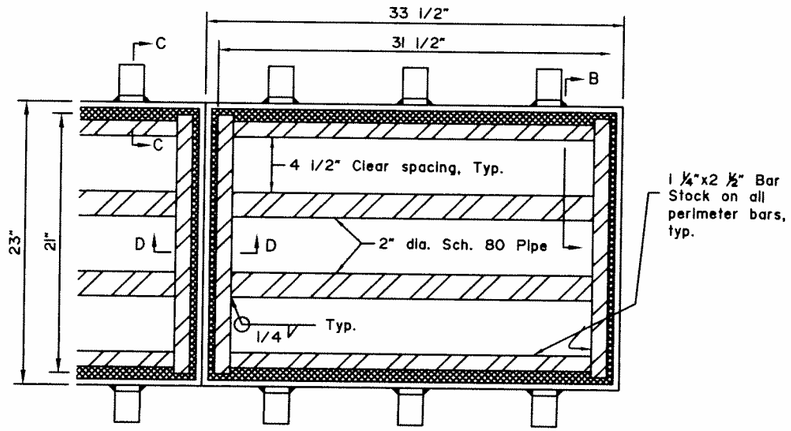
APPROVED 4/28/10
Date 5/31/12

C-05.20

D-42.11



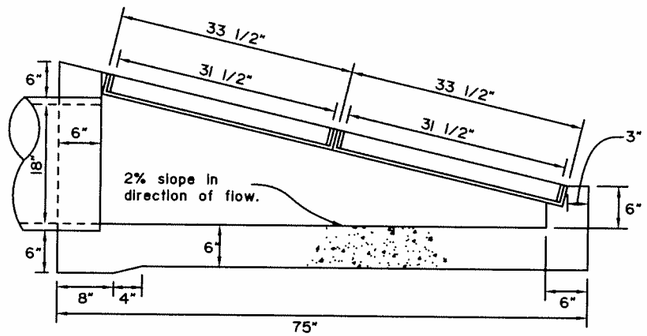
PLAN
(Frame not shown for clarity)



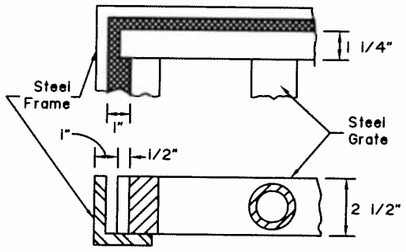
STEEL FRAME AND GRATE CONFIGURATION

GENERAL NOTES:

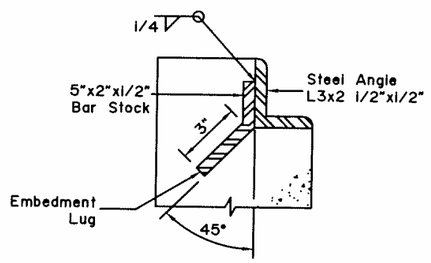
1. Provide either steel frames and grates or cast iron frames and grates.
2. Use Class A concrete.
3. Chamfer all exposed concrete corners ¾".
4. Provide 2" minimum cover for all reinforcing steel.
5. Use Gr. 40 minimum reinforcing steel.
6. Cast iron frame embedment lugs may differ from the configuration shown for the steel frame. Provide 6 total embedment lugs extending a minimum of 2" into concrete.
7. Shop fabricate steel frames and steel grates.
8. Hot dip galvanize steel frames and grates. Provide uncoated cast iron frames and grates.
9. Drawing is not to scale. Use dimensions shown.



SECTION A-A

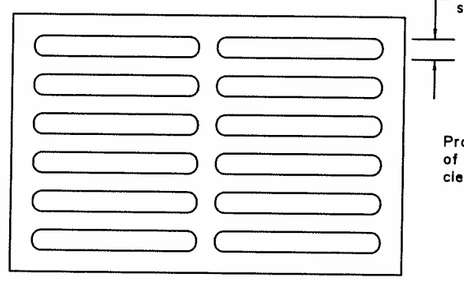


SECTION B-B

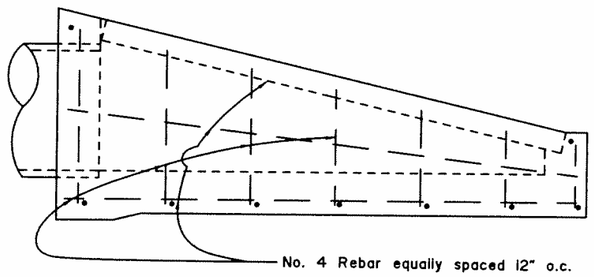


SECTION C-C

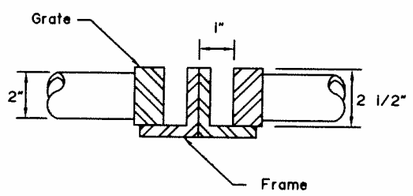
STEEL FRAME & GRATE DETAILS
Finished grate size is 21"x31 1/2"



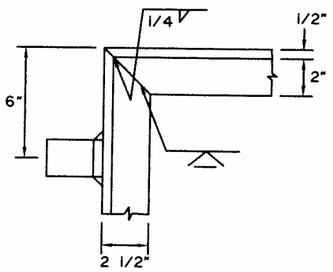
CAST IRON GRATE CONFIGURATION
Finished grate size is 21"x 31 1/2"



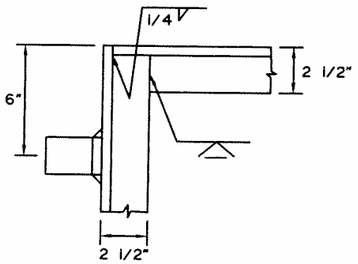
TYPICAL REINFORCEMENT STEEL DETAIL



SECTION D-D



STEEL FRAME DETAIL



ALTERNATE STEEL FRAME DETAIL

NOT TO SCALE

REVISIONS		
Date	Description	By
3/1/83	Revised Gen. Notes	WJF/HK
10/31/03	Redesign of grate	LRG
5/31/12	Remove Anchor Lug & allow cast iron	LRG

Sheet 1 of 1

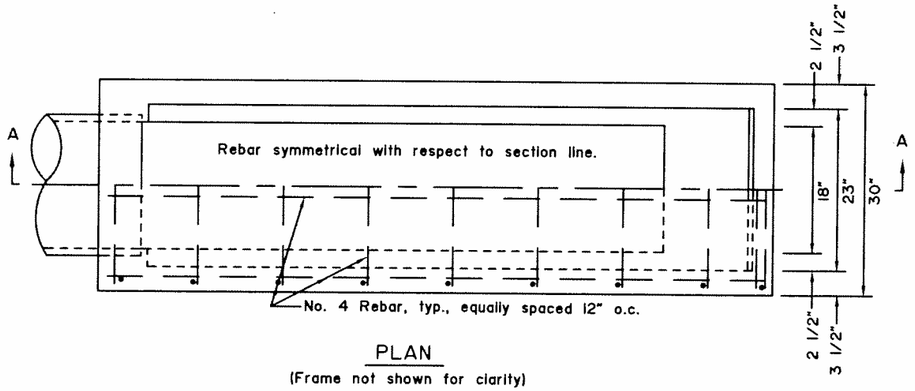
State of Alaska
Department of Transportation & Public Facilities

TYPE "C" INLET BOX 18 INCH PIPE ON 4:1 SLOPE

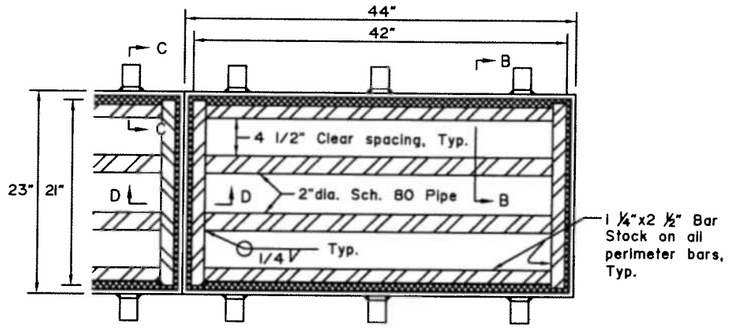
APPROVED
Date 5/31/12

D-42.11

D-43.11



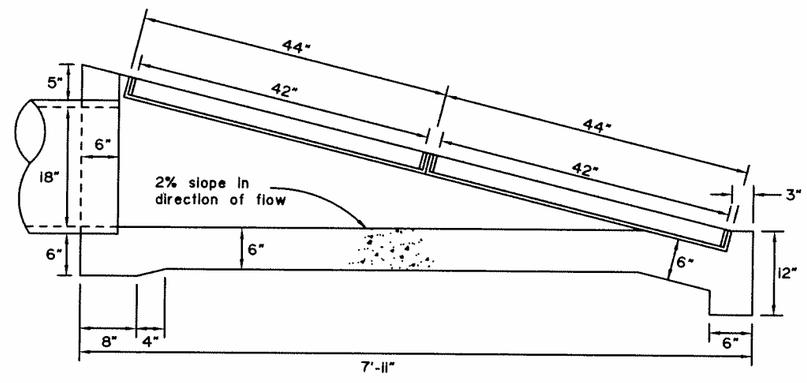
PLAN
(Frame not shown for clarity)



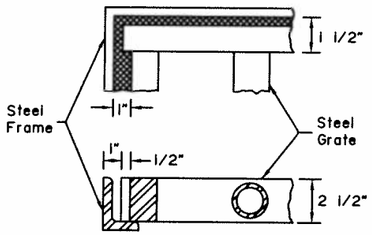
STEEL FRAME & GRATE CONFIGURATION

GENERAL NOTES:

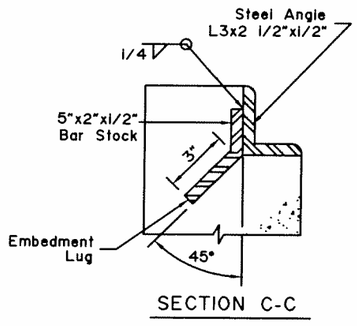
1. Provide either steel frames and grates or cast iron frames and grates.
2. Use Class Concrete.
3. Chamfer all exposed concrete corners ¾".
4. Provide 2" minimum cover for all reinforcing steel.
5. Use Gr. 40 minimum reinforcing steel.
6. Cast iron frame embedment lugs may differ from the configuration shown for steel frames. Provide 6 total embedment lugs extending into concrete a minimum of 2".
7. Shop fabricate steel frames and steel grates.
8. Hot dip galvanize steel frames and grates. Provide uncoated cast iron frames and grates.
9. Drawing is not to scale. Use dimensions shown.



SECTION A-A

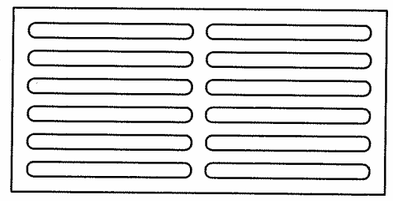


SECTION B-B

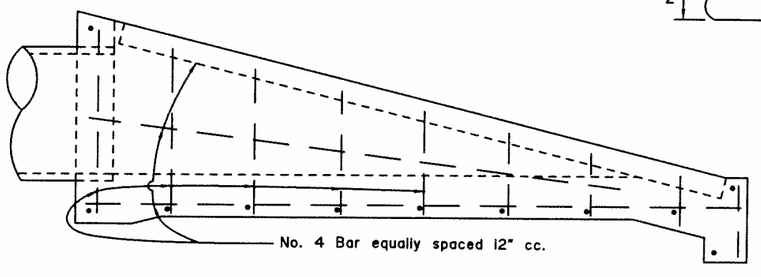


SECTION C-C

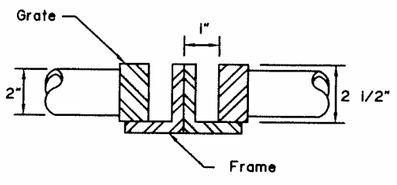
STEEL FRAME & GRATE DETAILS
Finished grate size is 21"x42"



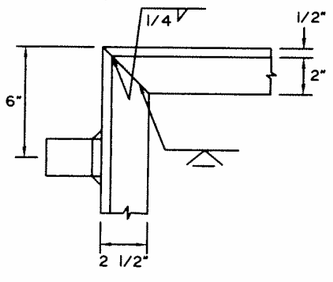
CAST IRON GRATE CONFIGURATION
Finished grate size is 21"x42"



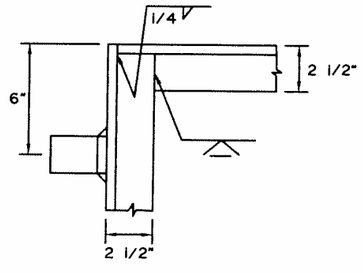
TYPICAL REINFORCEMENT STEEL DETAIL



SECTION D-D



STEEL FRAME DETAIL



ALTERNATE STEEL FRAME DETAIL

NOT TO SCALE

REVISIONS		
Date	Description	By
3/1/83	Revised Gen. Notes	WJF/HR
10/31/03	Redesign of grate	LRG
5/31/12	Remove Anchor Lug & allow cast iron	LRG

Sheet 1 of 1

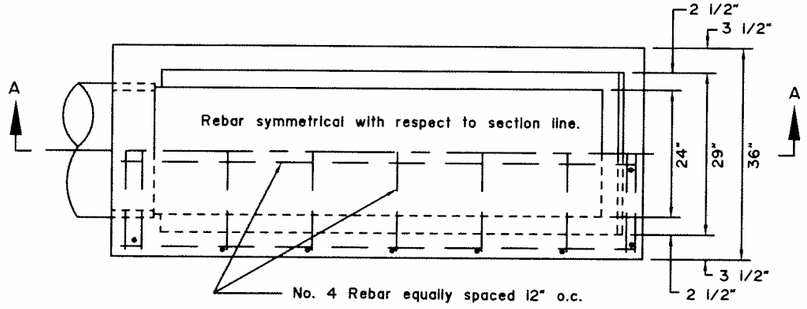
State of Alaska
Department of Transportation & Public Facilities

TYPE "D" INLET BOX 18 INCH PIPE ON 4:1 SLOPE

APPROVED
Date 5/31/12

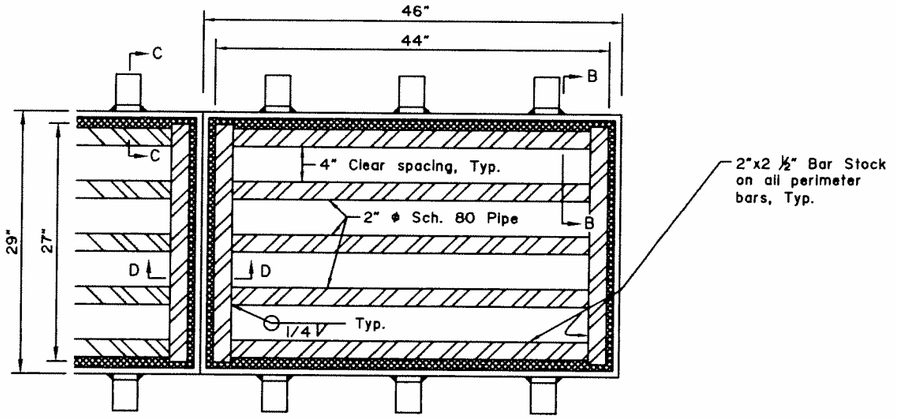
D-43.11

D-44.11



PLAN

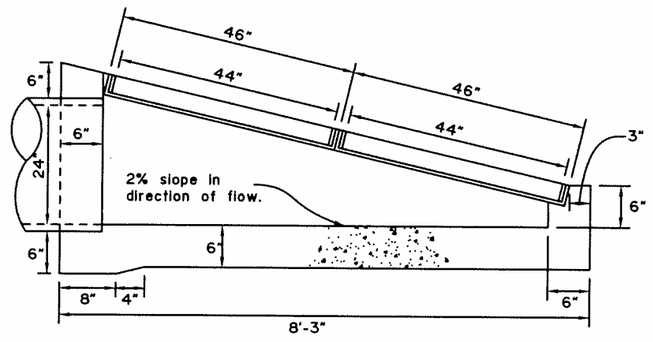
(Grate not shown for clarity)



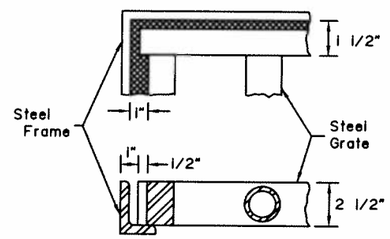
STEEL FRAME & GRATE CONFIGURATION

GENERAL NOTES:

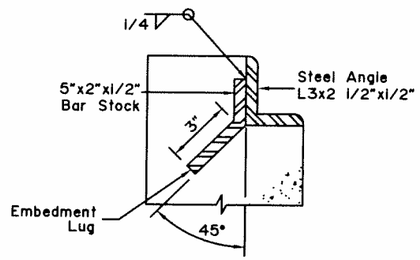
1. Provide either steel frames and grates or cast iron frames and grates.
2. Use Class Concrete.
3. Chamfer all exposed concrete corners ¾".
4. Provide 2" minimum cover for all reinforcing steel.
5. Use Gr. 40 minimum reinforcing steel.
6. Cast iron frame embedment lugs may differ from the configuration shown for steel frames. Provide 6 total embedment lugs extending into concrete a minimum of 3".
7. Shop fabricate steel frames and steel grates.
8. Hot dip galvanize steel frames and grates. Provide uncoated cast iron frames and grates.
9. Drawing is not to scale. Use dimensions shown.



SECTION A-A



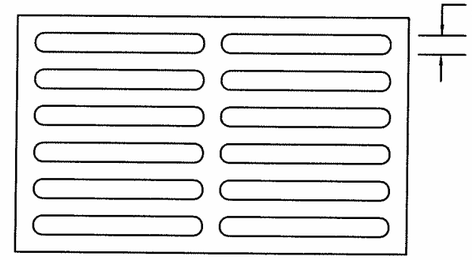
SECTION B-B



SECTION C-C

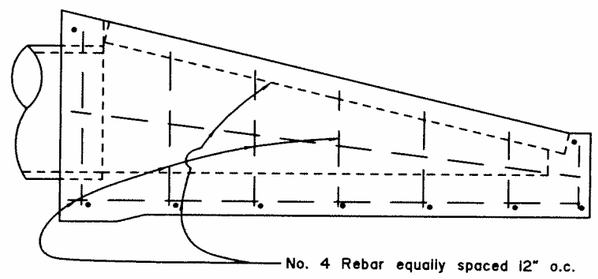
STEEL FRAME & GRATE DETAILS

Finished grate size is 27"x44"

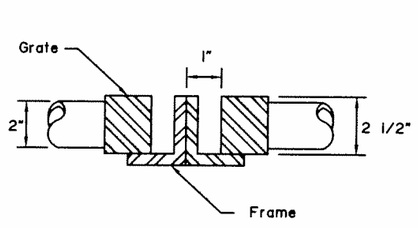


CAST IRON GRATE CONFIGURATION

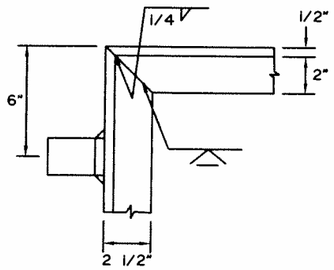
Finished grate size is 27"x44"



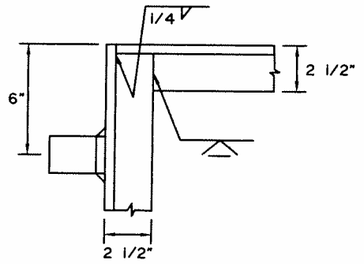
TYPICAL REINFORCEMENT STEEL DETAIL



SECTION D-D



STEEL FRAME DETAIL



ALTERNATE STEEL FRAME DETAIL

REVISIONS		
Date	Description	By
5/31/12	Remove anchor lug 8 allow cast iron	LRG

Sheet 1 of 1

State of Alaska
Department of Transportation
& Public Facilities

TYPE "C" INLET BOX 24 INCH PIPE ON 4:1 SLOPE

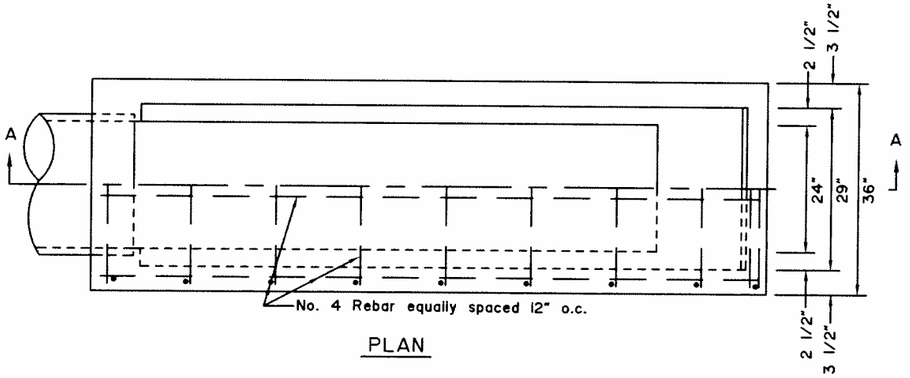
APPROVED

Date 5/31/12

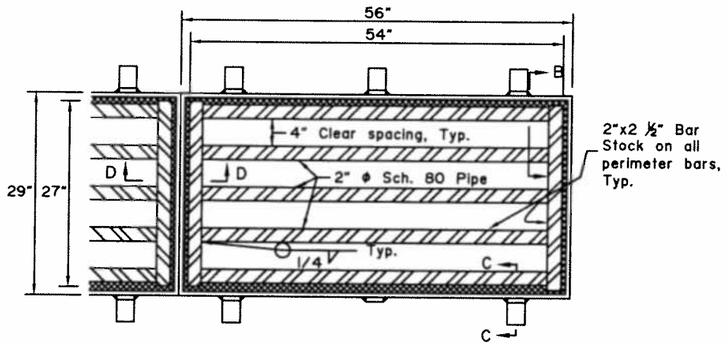
NOT TO SCALE

D-44.11

D-45.11



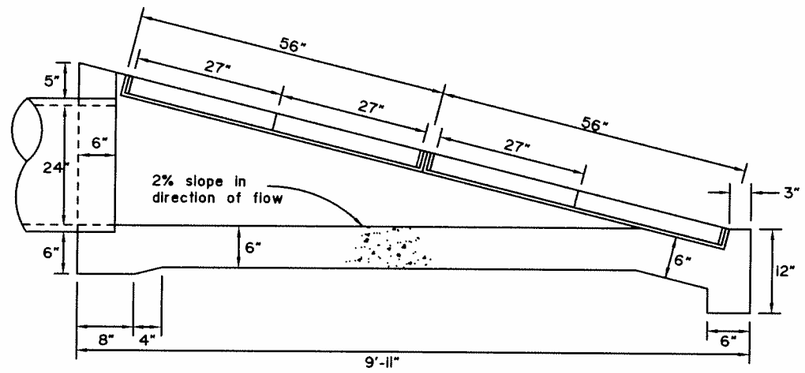
PLAN



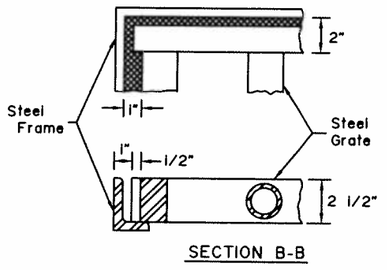
STEEL FRAME & GRATE CONFIGURATION

GENERAL NOTES:

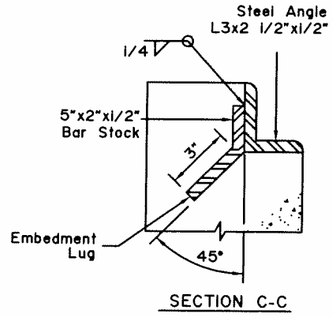
1. Provide either steel frames and grates or cast iron frames and grates.
2. Use Class Concrete.
3. Chamfer all exposed concrete corners ¾".
4. Provide 2" minimum cover for all reinforcing steel.
5. Use Gr. 40 minimum reinforcing steel.
6. Cast iron frame embedment lugs may differ from the configuration shown for steel frames. Provide 6 total embedment lugs extending into concrete a minimum of 2".
7. Shop fabricate steel frames and steel grates.
8. Hot dip galvanize steel frames and grates. Provide uncoated cast iron frames and grates.
9. Drawing is not to scale. Use dimensions shown.



SECTION A-A



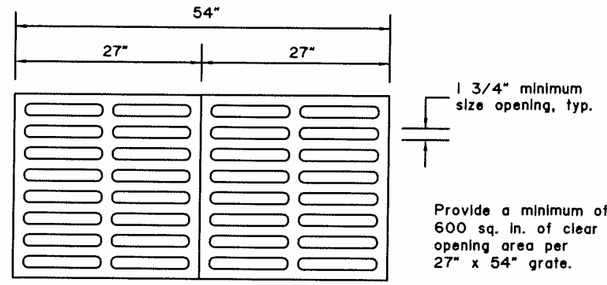
SECTION B-B



SECTION C-C

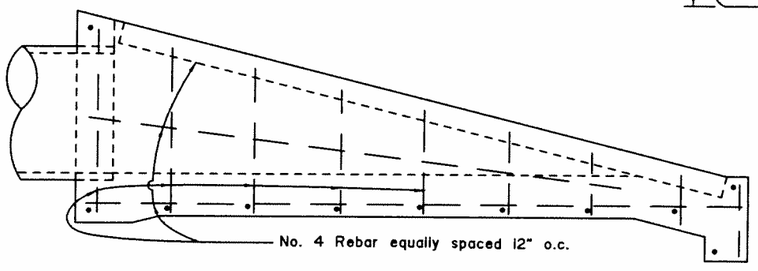
STEEL FRAME & GRATE DETAILS

Finished grate size is 27"x54"

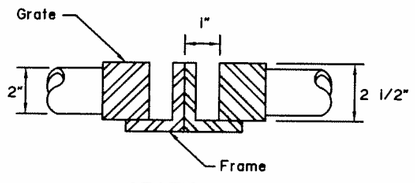


CAST IRON GRATE CONFIGURATION

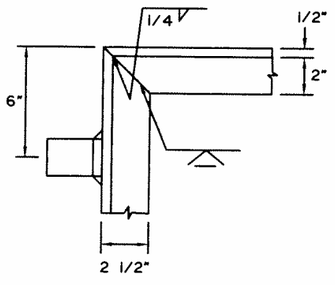
Finished grate size is 27"x54"
Shown with 2 ea. 27"x27" grates end-to-end



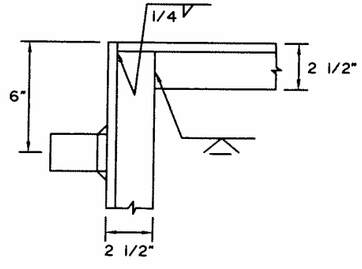
TYPICAL REINFORCEMENT STEEL DETAIL



SECTION D-D



STEEL FRAME DETAIL



ALTERNATE STEEL FRAME DETAIL

NOT TO SCALE

REVISIONS		
Date	Description	By
3/1/83	Revised Gen. Notes	WJF/HK
10/30/03	Redesign of grate	LRG
5/31/11	Remove Anchor Lug & allow cast iron	LRG

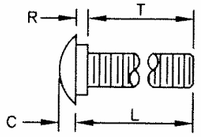
Sheet 1 of 1

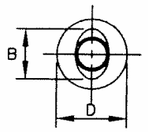
State of Alaska
Department of Transportation & Public Facilities

TYPE "D" INLET BOX 24 INCH PIPE ON 4:1 SLOPE

APPROVED
Date 5/31/12

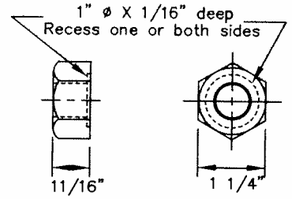
D-45.11



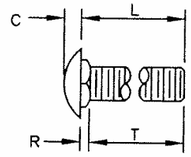


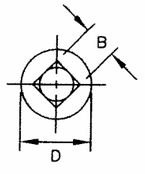
B	C	D	L (Length)	R	T (Thread Length)
15/16"	5/16"	1 5/16" or 1 7/16"	As Required	7/32"	As Required

5/8" BUTTONHEAD BOLT



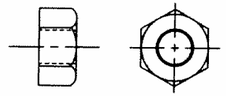
5/8" Dia. RECESSED HEX NUT





B	C	D	L (Length)	R	T (Thread Length)
5/8"	5/16"	1 5/16"	As Required	3/16"	As Required

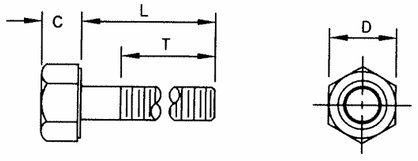
5/8" Dia. CARRIAGE BOLT



STANDARD HEX NUT

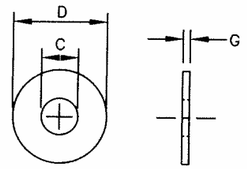
GENERAL NOTES:

1. All covered hardware shall comply with the AASHTO/AGC/ARTBA "A Guide to Standardized Highway Barrier Hardware", latest edition.



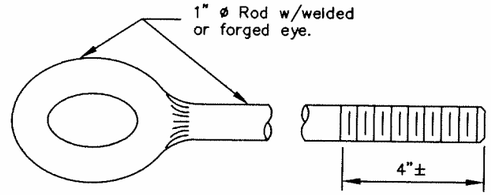
Bolt Size	C	D	L (Length)	T (Thread Length)
5/16"	—	—	1 1/2"	7/8"
5/16"	—	—	1"	1"
3/8"	—	—	7 1/2"	1 1/2"
1/2"	—	—	1 1/2"	1 1/2"
1/2"	—	—	1 1/4"	1 1/4"
5/8" H.S.	5/16"	7/8"	8"	1 1/2"
5/8"-11	—	—	1 1/2"	1 1/2"
3/4"	—	—	1 1/2"	1 1/2"
3/4"	—	—	As Required	2"
3/4" H.S.	15/32"	1 1/4"	2"	1 1/2"

STANDARD HEX BOLTS

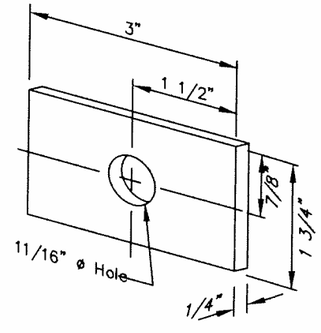


For Bolt ø	C	D	G
3/8"	7/16"	1"	5/64"
1/2"	17/32"	1 1/16"	3/32"
1/2" H.S.	17/32"	1 1/16"	3/32"
5/8"	11/16"	1 3/4"	9/64"
3/4"	13/16"	1 15/32"	9/64"
3/4" H.S.	13/16"	2"	5/32"
1"	1 1/16"	2"	9/64"

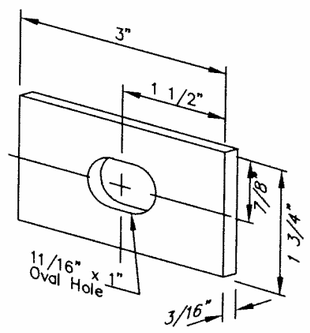
STANDARD STEEL WASHERS



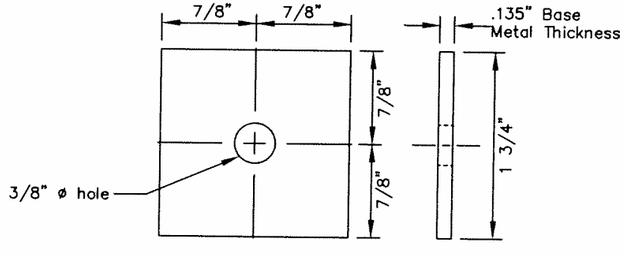
EYE BOLT



FLAT PLATE WASHER



RECTANGULAR POST BOLT WASHER



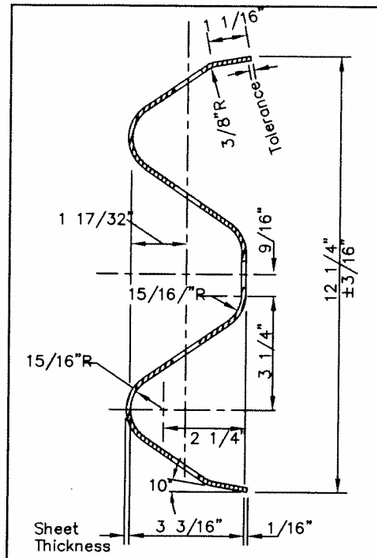
SQUARE STEEL WASHER

REVISIONS		
Date	Description	By
3/15/99	Delete BCT Hardware	KJS

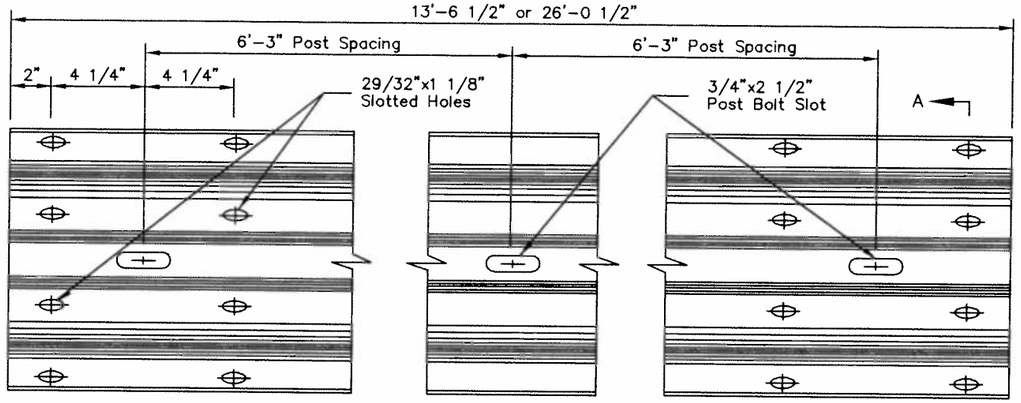
State of Alaska
Department of Transportation
& Public Facilities

STANDARD GUARDRAIL HARDWARE
(NUTS, BOLTS, WASHERS)

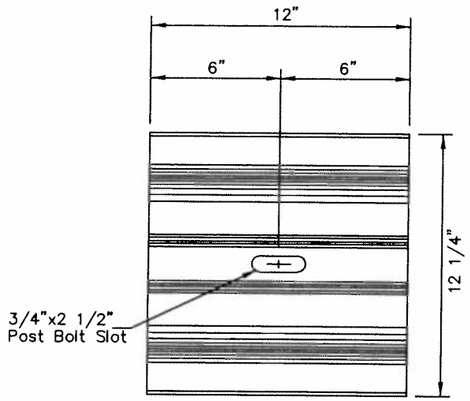
APPROVED
Date 5/31/12



SECTION A–A



STANDARD W-BEAM PANEL



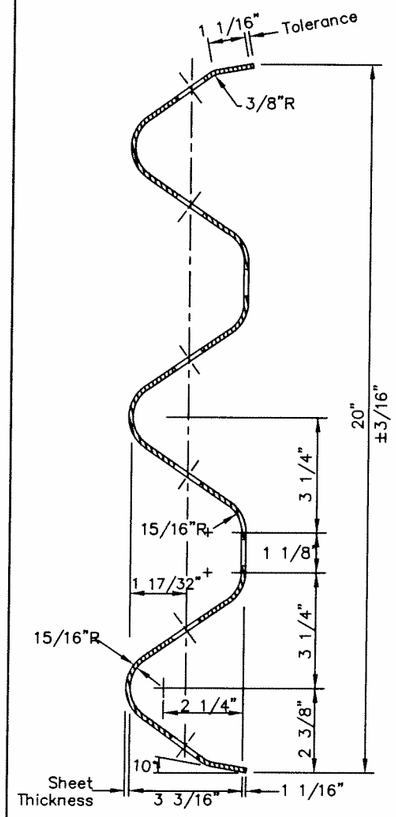
W-BEAM BACKUP PLATE

G-00.02

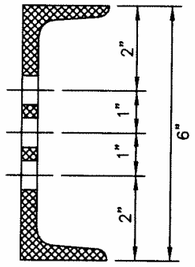
SHEET 2 of 4

GENERAL NOTES:

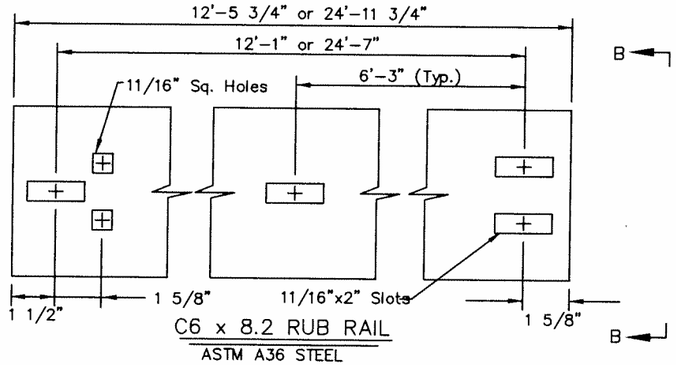
1. Provide hardware compliant with the AASHTO/AGC/ARTBA "A Guide to Standardized Highway Barrier Hardware, latest edition.
2. Install back–up plates between blockouts and w–beam or thrie–beam rail at intermediate (non–splice) posts when steel blockouts are used but not with wood, rubber, plastic, or other approved blockouts.
3. Provide Thrie beam and W–beam compliant with AASHTO M180A. Use 12 gauge (0.105") thick steel for both.



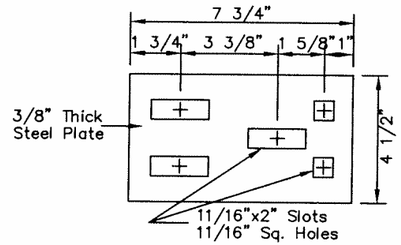
SECTION C–C



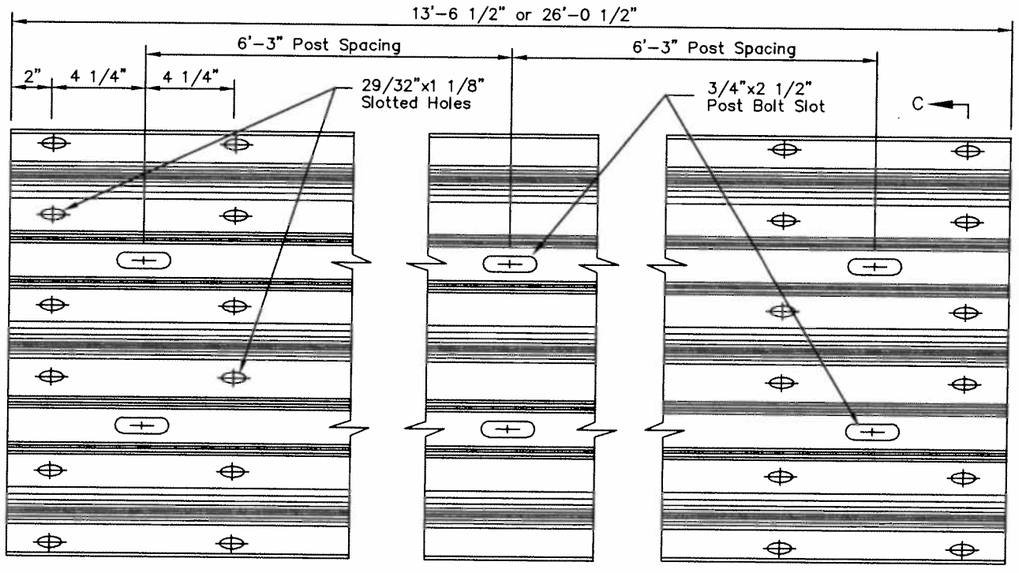
SECTION B–B



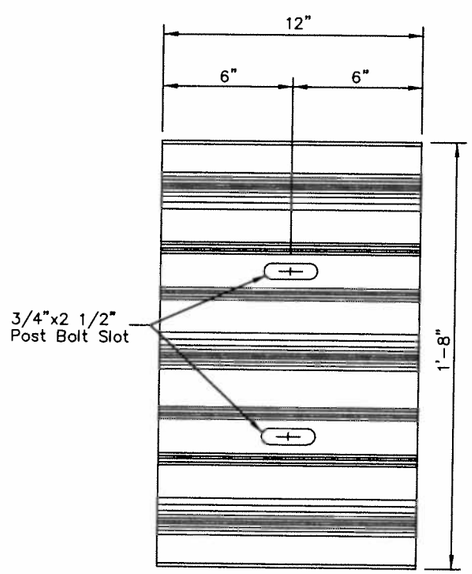
C6 x 8.2 RUB RAIL
ASTM A36 STEEL



SPLICE PLATE
ASTM A36 STEEL



STANDARD THRIE BEAM PANEL



THRIE BEAM BACKUP PLATE

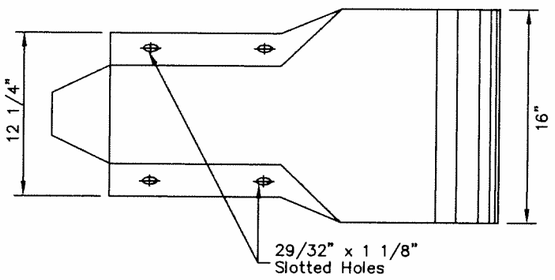
REVISIONS		
Date	Description	By
4/28/10	Revise General Notes	KJS

State of Alaska
Department of Transportation
& Public Facilities

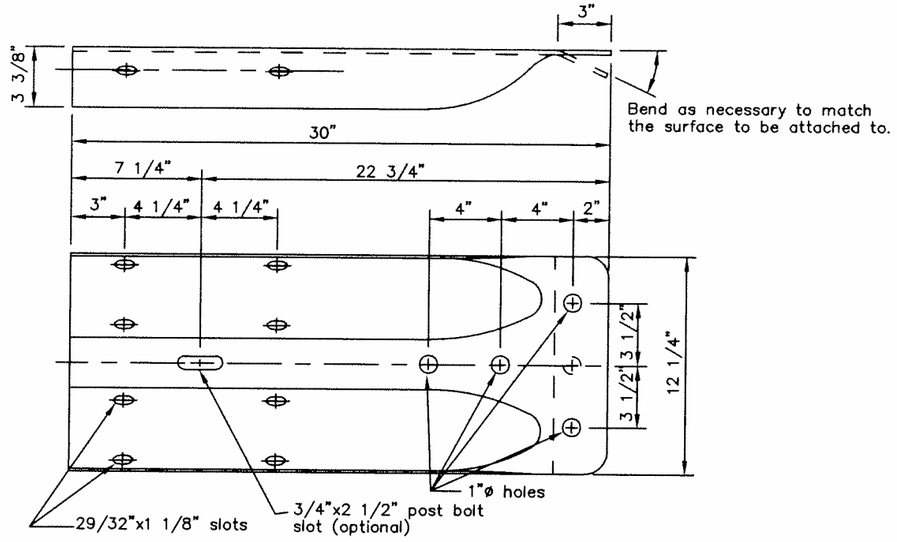
STANDARD GUARDRAIL HARDWARE (RAILS AND SPLICES)

APPROVED
Date 5/31/12

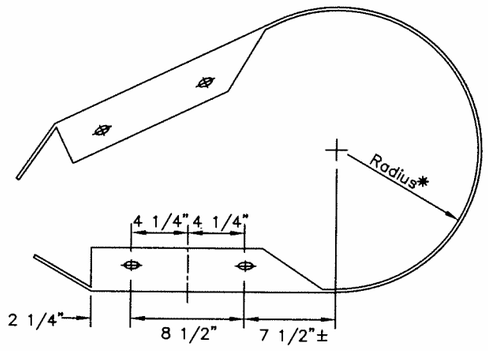
G-00.02



PROFILE



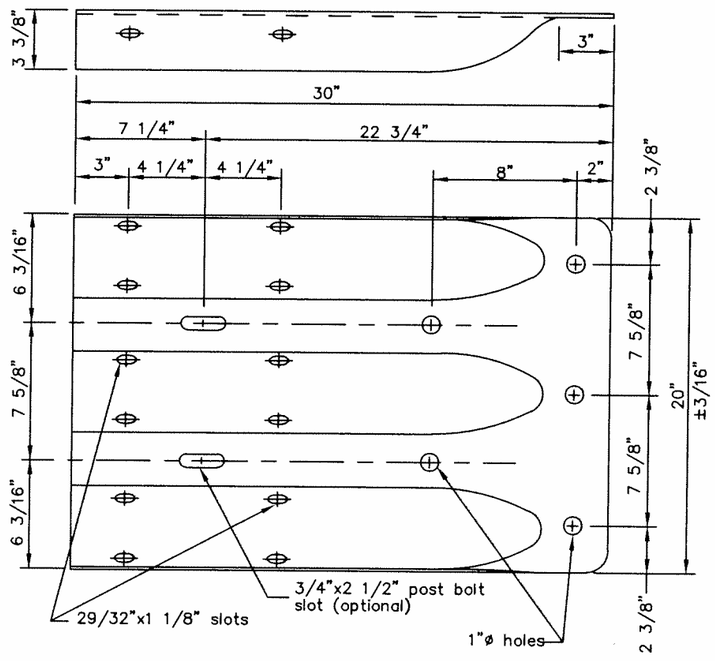
STANDARD W-BEAM TERMINAL CONNECTOR



W-BEAM PLAN VIEW

*Radius to be specified on the plans

STANDARD W-BEAM END SECTION



STANDARD THRIE BEAM TERMINAL CONNECTOR

GENERAL NOTES:

1. W-Beam and Thrie Beam Terminal Connectors shall conform to AASHTO M180, Class B, Type 2.
2. W-Beam end sections shall conform to AASHTO M180, Class A, Type 2.
3. All covered hardware shall comply with the AASHTO/AGC/ARTBA "A Guide to Standardized Highway Barrier Hardware", latest edition.

REVISIONS		
Date	Description	By
3/15/99	Delete Thrie End Sect.	KJS

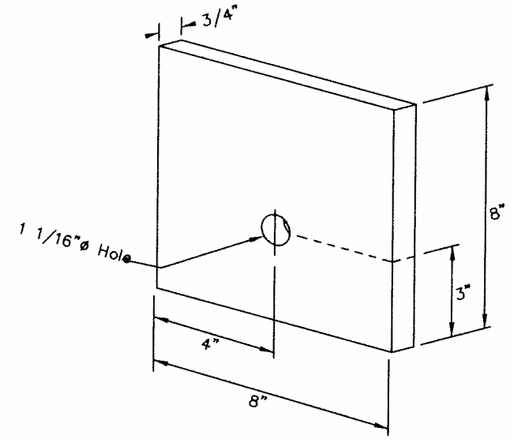
State of Alaska
Department of Transportation
& Public Facilities

STANDARD GUARDRAIL HARDWARE (TERMINAL CONNECTORS)

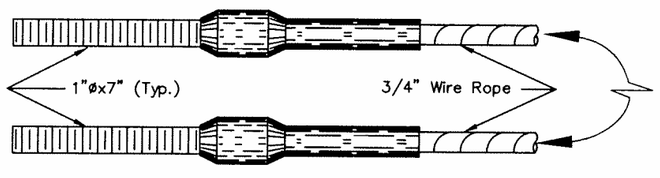
APPROVED

Date 5/31/12

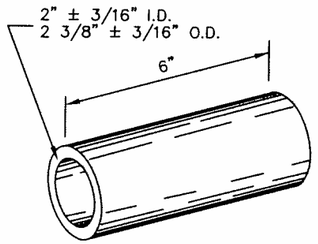
G-00.02



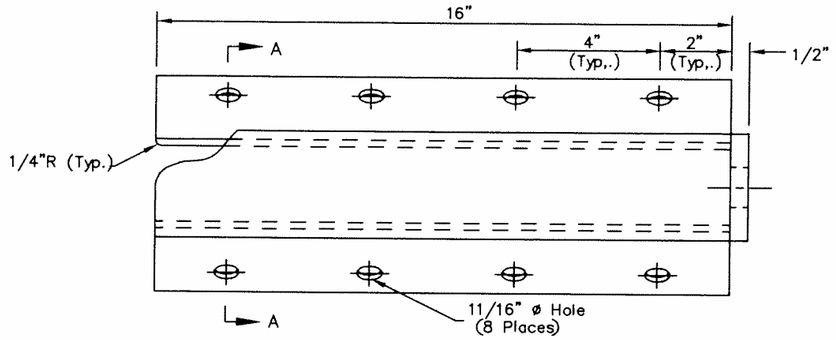
BEARING PLATE for CRT TERMINAL ANCHOR



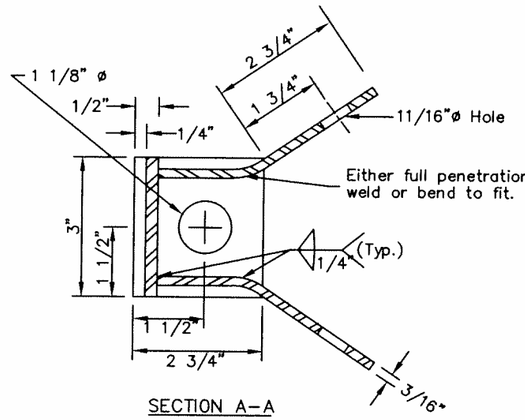
SWAGED FITTING DETAIL



SLEEVE DETAIL

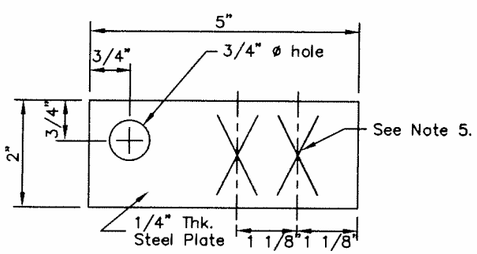


CABLE ANCHOR PLATE

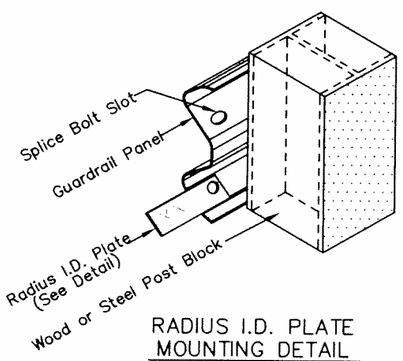


SECTION A–A

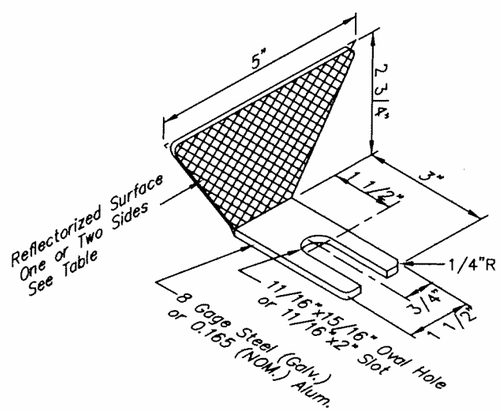
CONTROLLED RELEASE TERMINAL HARDWARE DETAILS



RADIUS I.D. PLATE



RADIUS I.D. PLATE MOUNTING DETAIL



GUARDRAIL REFLECTOR

Type	Guardrail Reflectors Color	Reflectorized
A	White	Front & Rear
B	White	Front
C	Yellow	Front
D	Yellow	Front & Rear

G-00.02

SHEET 4 of 4

GENERAL NOTES:

1. Cable Anchor Plate may be formed in single unit or welded fabrication.
2. Anchor Cable Assembly shall conform to AASHTO M–30 with Type II Wire Rope.
3. Sleeve for Wood Posts shall conform to the requirements of ASTM A120 and shall be of 2–inch galvanized standard pipe. Sleeve shall be a tight, pressed fit in post.
4. Bolts, nuts and washers shall conform to ASTM A–325 and galvanized in accordance with ASTM A–153.
5. Radius ID plates shall be attached to all shop–bent guardrail sections. They shall be bolted to the back side of the guardrail panel with the lower splice bolt nearest the P.C. of the radius.
6. Rail bend radius in feet shall be shown as "XX" on the radius ID plate. Digits shall be etched or stamped and have a min. height of 1 1/2" and a max. width of 3/4". The plate shall be galvanized after digits are marked.
7. All covered hardware shall comply with the AASHTO/AGC/ARTBA "A Guide to Standardized Highway Barrier Hardware", latest edition.

REVISIONS		
Date	Description	By
3/15/99	Delete BCT Hardware	KJS

State of Alaska
Department of Transportation
& Public Facilities

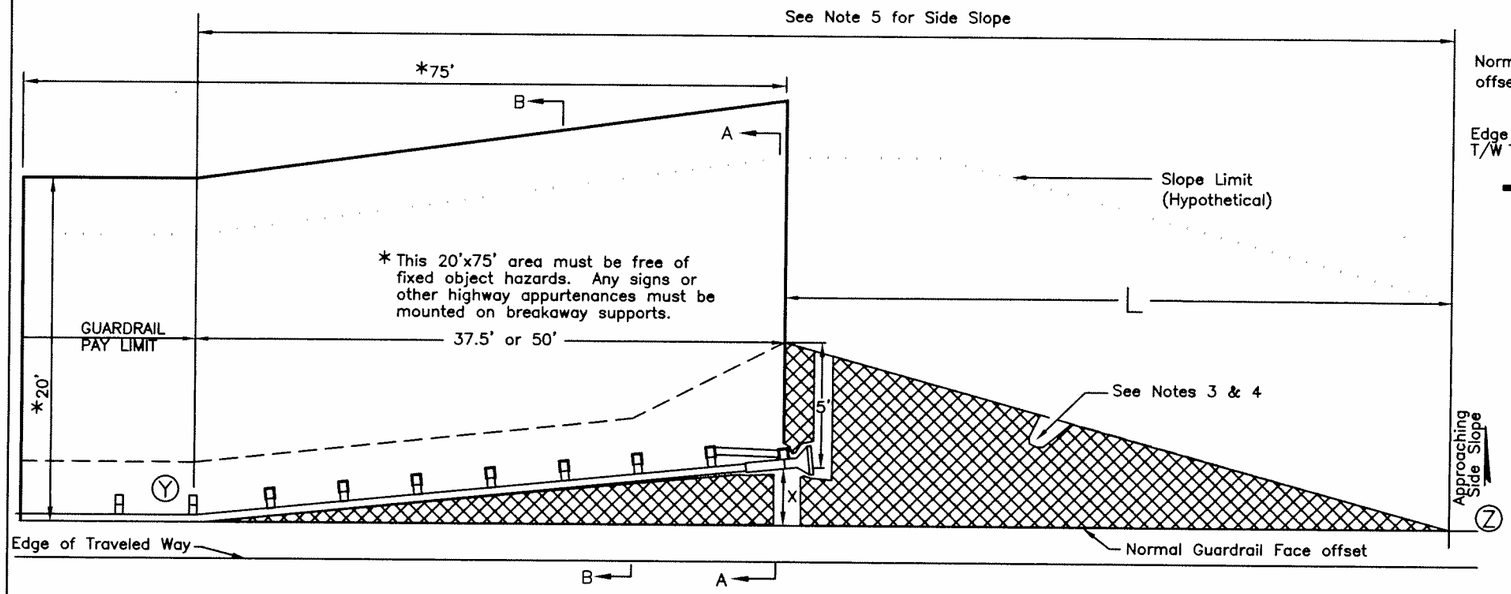
STANDARD GUARDRAIL HARDWARE (MISCELLANEOUS)

APPROVED 4/28/10

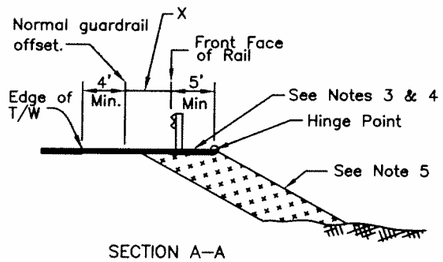
Date 5/31/12

G–00.02

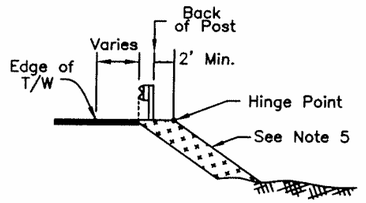
G-20.11



STANDARD GUARDRAIL TERMINAL WIDENING DETAIL



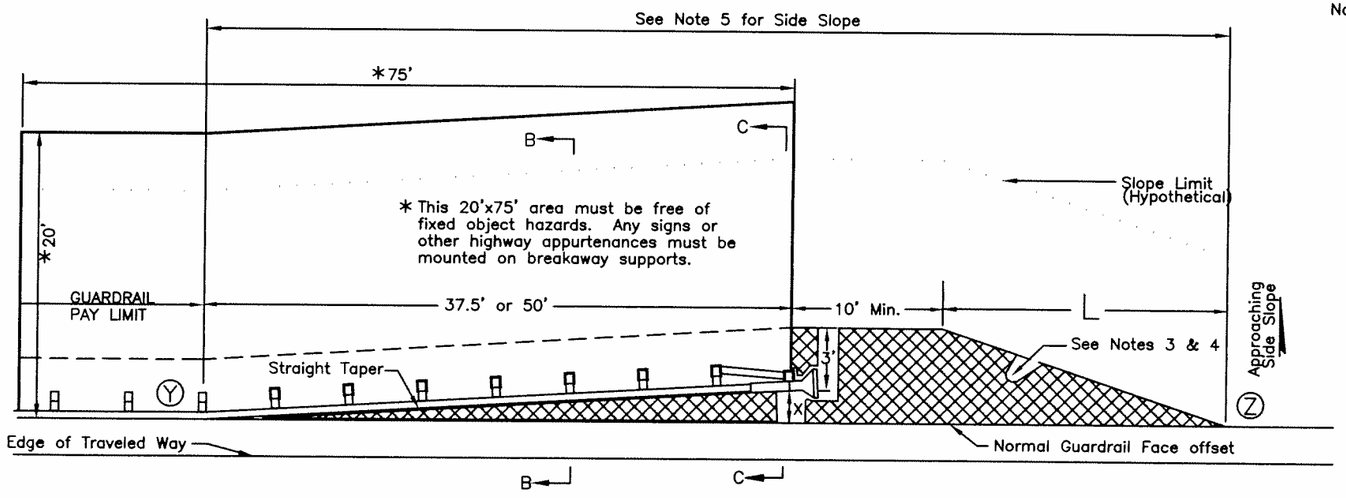
SECTION A–A



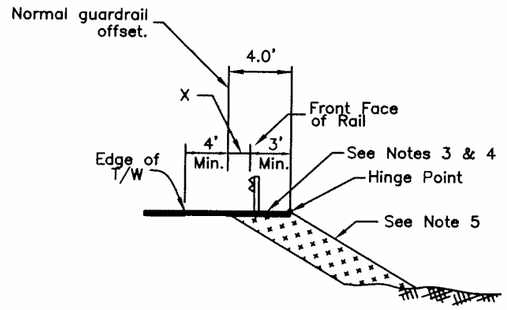
SECTION B–B
(Applies to both drawings)

GENERAL NOTES:

1. The standard detail applies to all approved guardrail terminals, including those with parabolic flares. The alternate detail may only be used with straight terminals. The terminal details shown are for illustration only – see manufacturer's drawings for actual post, rail, etc. drawings.
2. Use the standard detail for all terminals except when upgrading existing non–NCHRP 350 or MASH compliant terminals to NCHRP 350 or MASH compliant terminals where site conditions make the use of the standard detail infeasible. In that case, use the alternate detail.
3. Construct the hatched areas to match the slope of the adjacent shoulder to a maximum slope of 10:1. Maintain 10:1 for steeper shoulders. Match the slope when the shoulder slopes toward the road as well as away from the road.
4. On paved roads, the hatched areas shall be paved. On gravel roads, surface the hatched areas with the same materials used to surface the travel lanes.
5. From point Ⓨ to point Ⓩ make the side slope match the approaching side slope except where it is flatter than 4:1. In that case, the slope may be steepened to 4:1.
6. Attach a flexible marker to the first point (where the flare begins) and the end post of each terminal.
7. The maximum allowable height for foundation tubes or other steel components of terminal post breakaway systems is 4 inches above the surrounding grade.
8. The details on this sheet do not apply to Controlled Release Terminals (G–25) or Downstream End Anchors (G–13).
9. On two–way undivided roads, the details on this sheet do apply to NCHRP 350 or MASH compliant guardrail terminals on both the approach and downstream ends.



ALTERNATE GUARDRAIL TERMINAL WIDENING DETAIL



SECTION C–C

X: End offset. See manufacturer's information for the range of acceptable (NCHRP 350 or MASH compliant) end offsets for each terminal.

Taper Lengths (L) for Common End Offsets (X)		
End Offset	Standard Detail	Alternate Detail
0'	15.0'	10.0'
1'	17.0'	10.0'
1.5'	20.0'	15.0'
2'	22.0'	15.0'
2.5'	25.0'	15.0'
4'	30.0'	20.0'
Interpolate if the end offset falls between table values		

REVISIONS		
Date	Description	By
3/6/02	Change ET Offset	KJS
2/28/03	Major Revisions	KJS
4/28/10	Revise General Notes	KJS

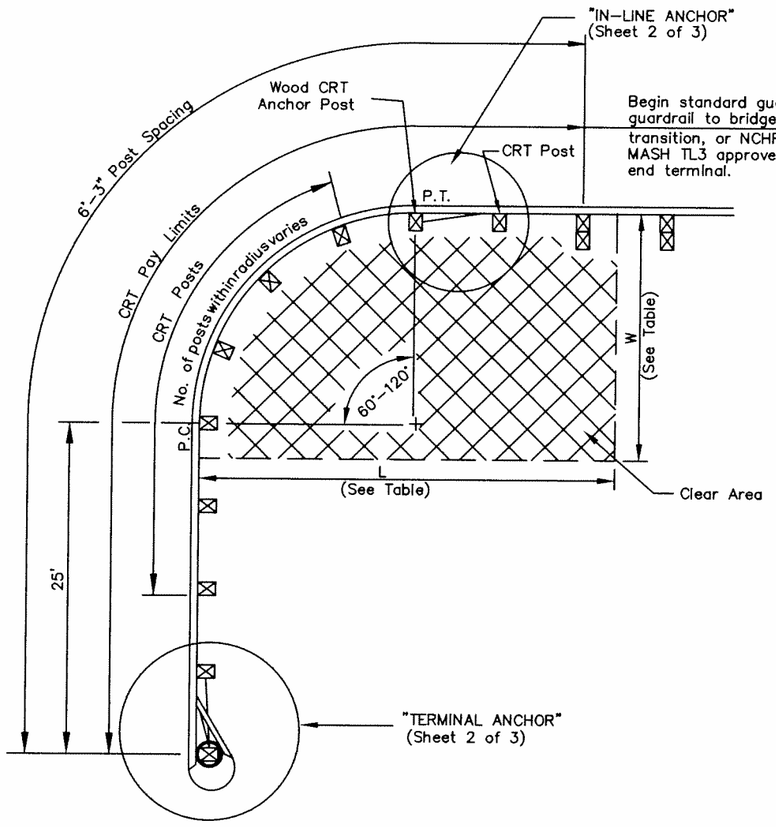
Sheet 1 of 1

State of Alaska
Department of Transportation
& Public Facilities

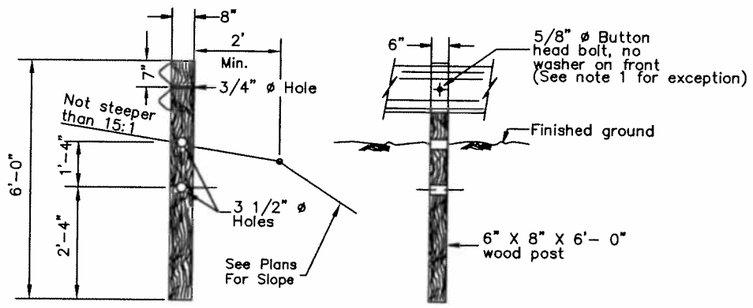
WIDENING FOR GUARDRAIL END TERMINALS

APPROVED
Date 5/31/12

G-20.11



CONTROLLED RELEASE TERMINAL PLAN



CONTROLLED RELEASE TERMINAL (CRT) POST

GENERAL NOTES:

CRT RADIUS TABLE *					
Curve Radius, Ft. (Rounded)	Curve Length	Number of Rail Sections	Clear Area Length (L)	Clear Area Width (W)	** Number of Posts
8'	12.50'	1.0	25	15	5
12'	18.75'	1.5	25	15	6
16'	25.00'	2.0	30	15	7
20'	31.25'	2.5	33	15	8
24'	37.50'	3.0	37	20	9
28'	43.75'	3.5	40	20	10
32'	50.00'	4.0	45	20	11
36'	56.25'	4.5	50	20	12

* The table applies only to 90° approaches or driveways.

**Number of CRT posts includes one for the In-Line Anchor.

1. Do not bolt rail to central post on 8' radius CRT.
2. CRTs on 60° to 120° approaches are allowed provided they are constructed with posts at the P.C. and P.T. and the posts are placed on uniform 6'-3" centers.
3. CRT connections are not limited to what is shown. Terminal Anchors, NCHRP 350 or MASH TL3 compliant guardrail end terminals, guardrail to bridge-rail transitions, or standard guardrail may be attached to either end, or both ends of the apparatus.
4. The Terminal Anchor shall only be placed on approaches where motorists are required to stop or yield.
5. The Clear Area shall be free of fixed object hazards. Any signs or other highway appurtenances in the clear area must be mounted on NCHRP 350 or MASH compliant breakaway supports.

REVISIONS		
Date	Description	By
4/28/10	Reorient in-line anchor	KJS

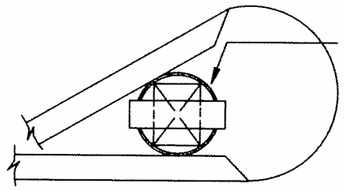
State of Alaska
Department of Transportation
& Public Facilities

WOOD POST CONTROLLED RELEASE TERMINAL (CRT)

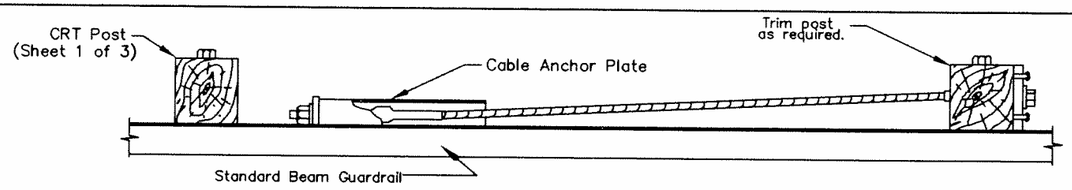
APPROVED

Date 5/31/12

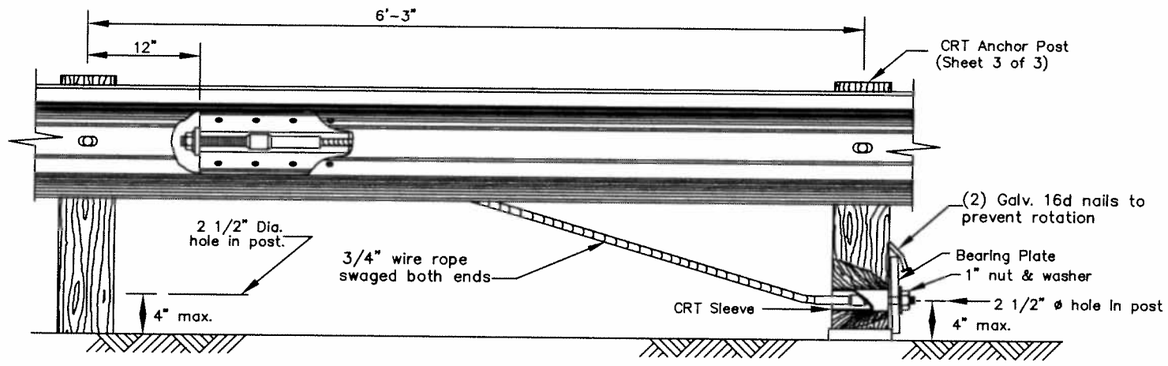
G-25.21W



ROTATING POST CAP

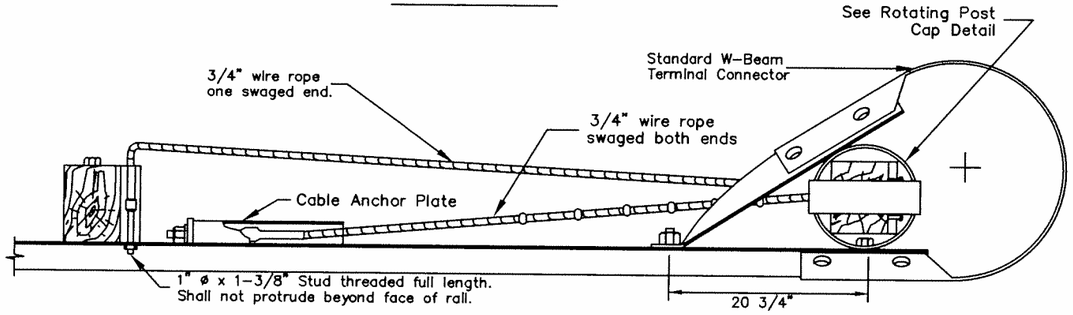


PLAN

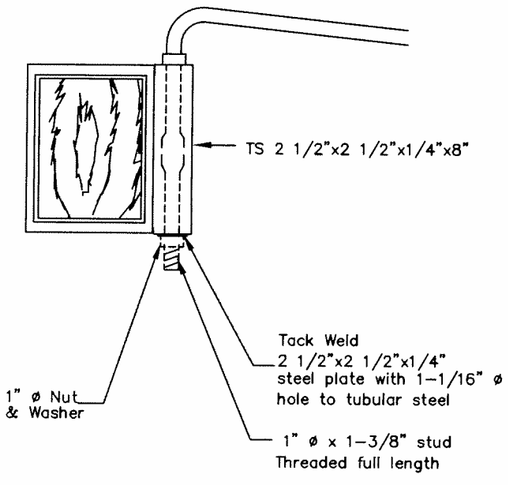


ELEVATION

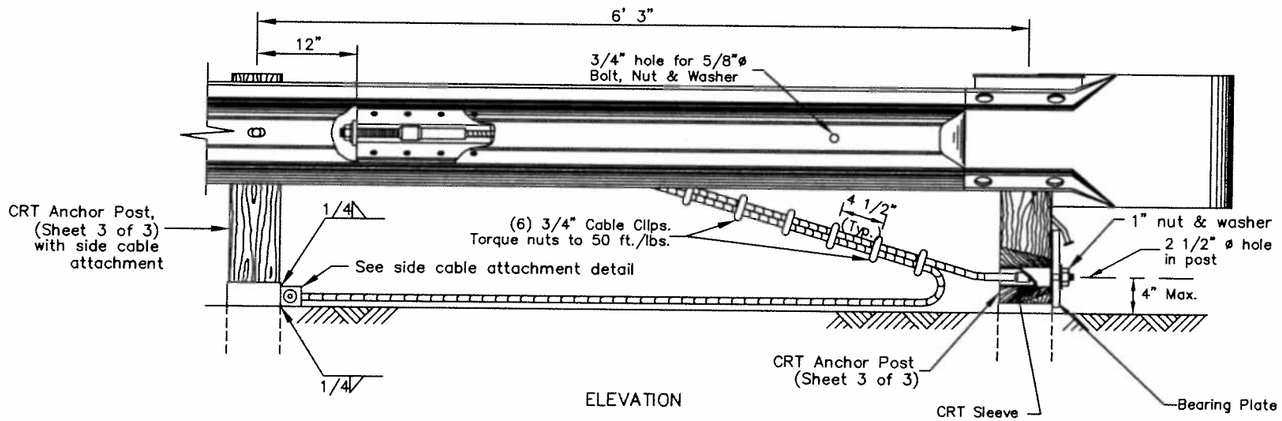
IN-LINE ANCHOR



PLAN



SIDE CABLE ATTACHMENT



ELEVATION

TERMINAL ANCHOR

GENERAL NOTES:

1. Hardware details not shown here shall conform to drawings G-04 & G-00.
2. All covered hardware shall comply with the AASHTO/AGC/ARTBA "A Guide to Standardized Highway Barrier Hardware", latest edition.

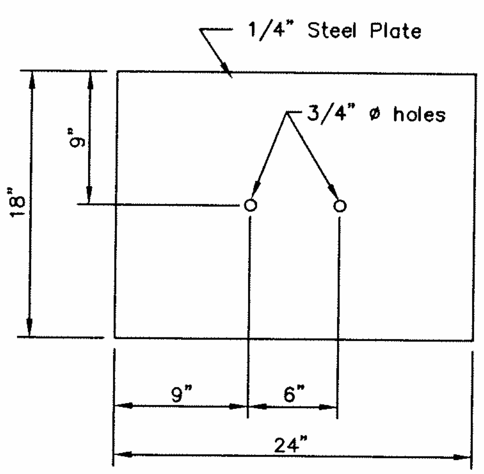
REVISIONS		
Date	Description	By

State of Alaska
Department of Transportation & Public Facilities

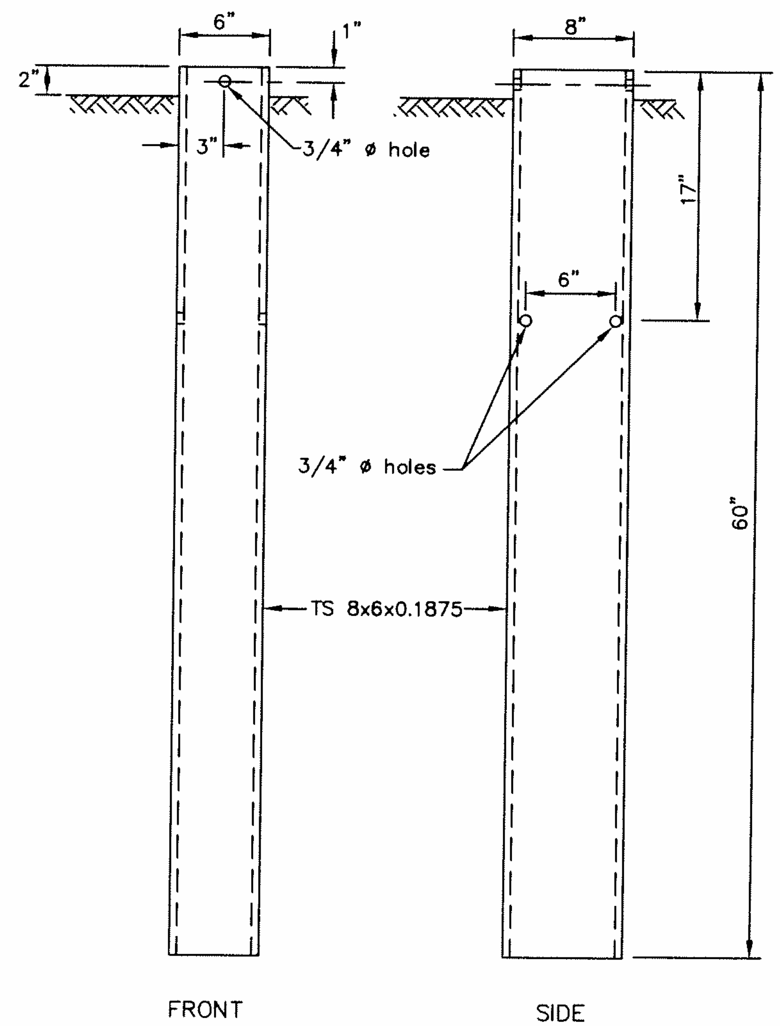
WOOD POST CONTROLLED RELEASE TERMINAL ANCHORS

APPROVED
Date 5/31/12

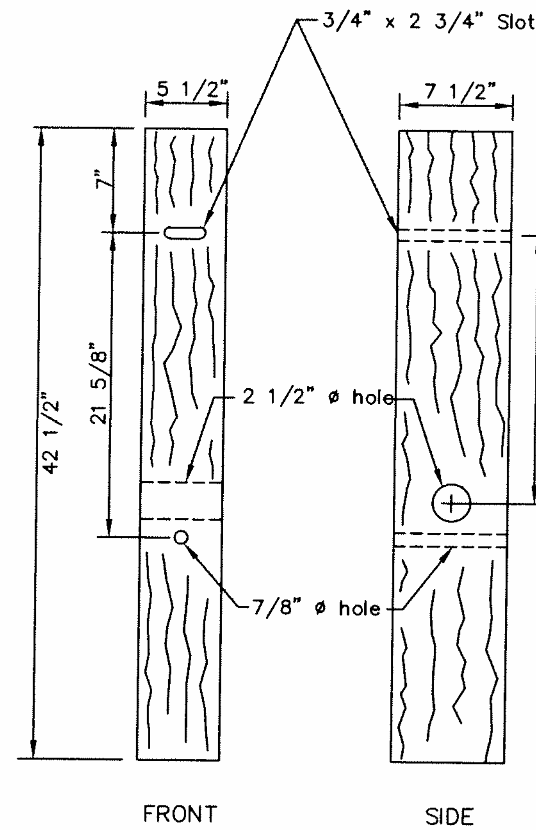
G-25.21W



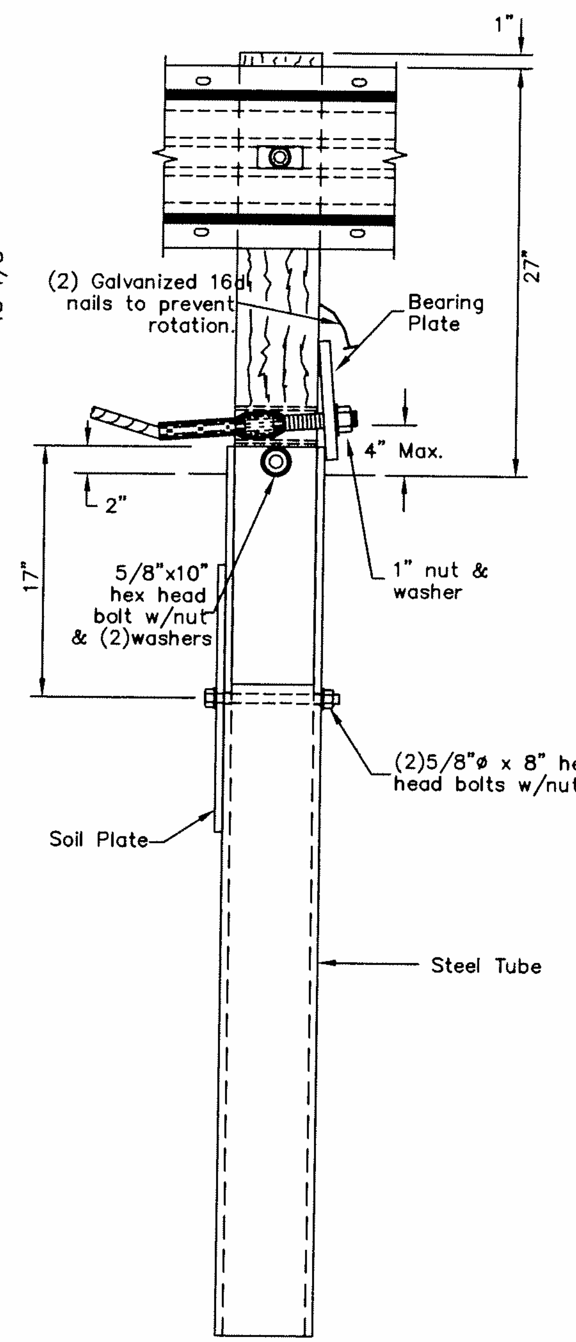
STEEL SOIL PLATE



STEEL TUBE



WOOD POST



ASSEMBLY

GENERAL NOTES:

1. Hardware details not shown here shall conform to drawings G-04 & G-00.
2. All covered hardware shall comply with the AASHTO/AGC.ARTBA "A Guide to Standardized Highway Barrier Hardware", latest edition.
3. Each CRT Anchor Post with a cable attached shall conform to these details except the 2nd post in the Terminal Anchor, which shall conform except for the method of cable attachment (See sheet 2 of 3).

REVISIONS		
Date	Description	By

State of Alaska
Department of Transportation
& Public Facilities

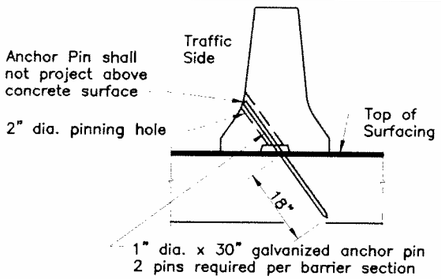
WOOD POST CONTROLLED RELEASE TERMINAL ANCHOR POSTS

APPROVED

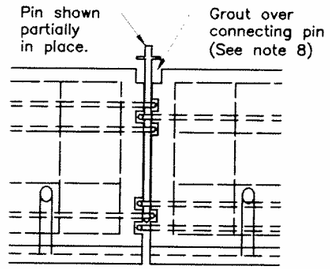
Date 5/31/12

G-25.21W

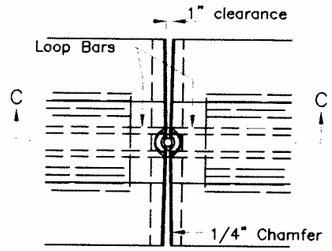
G-46.11



PINNING CONCRETE BARRIER TO ROADWAY
(Use when required by plans or as directed)

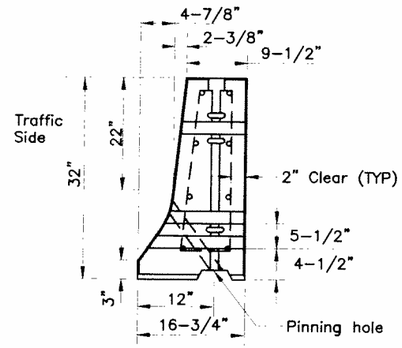


SECTION C–C
For details not shown
see End Views A–A and B–B



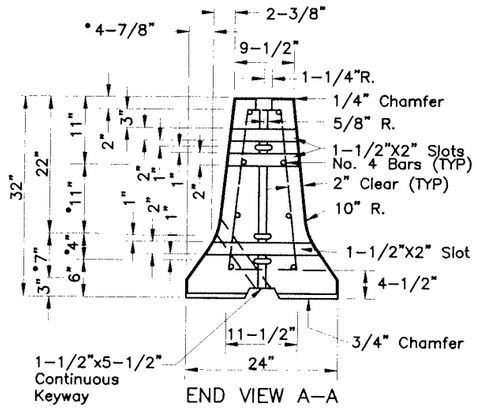
PLAN
For details not shown
see End Views A–A and B–B

CONNECTING PIN AND LOOP CONNECTION

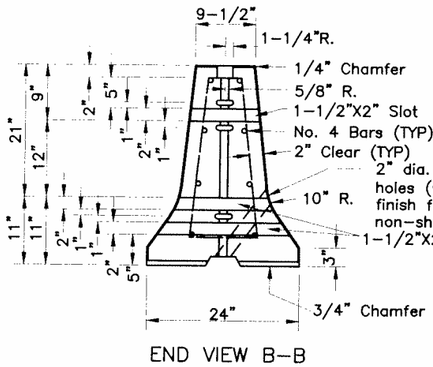


SHOULDER BARRIER

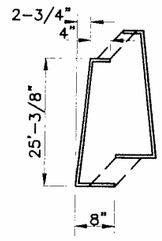
* Dimensions marked thus are to the Intersection point of the barrier slopes.



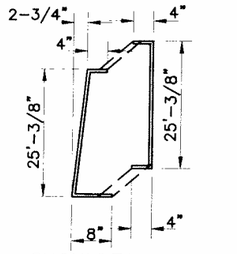
END VIEW A–A



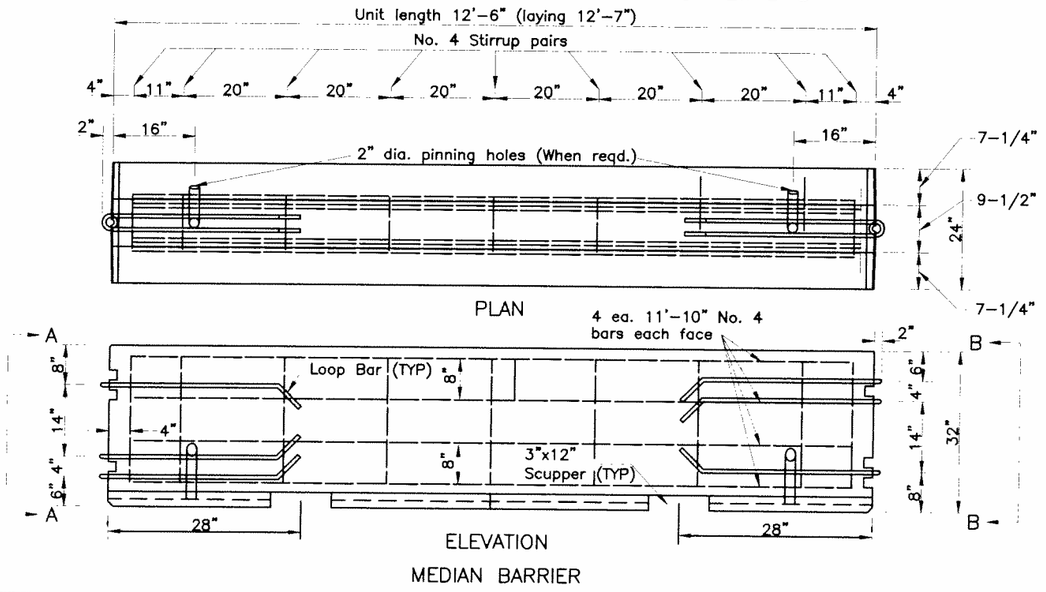
END VIEW B–B

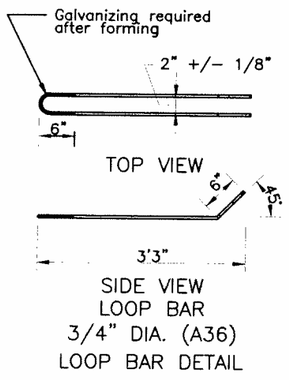


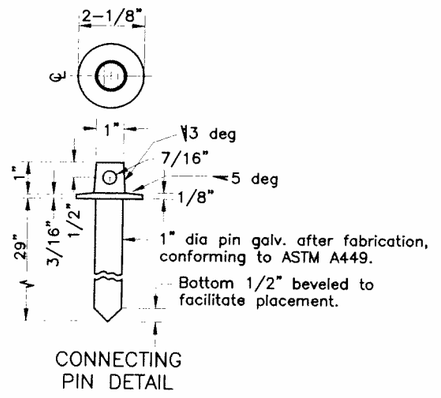
MEDIAN BARRIER STIRRUP
No. 4 REBAR



SHOULDER BARRIER STIRRUP
No. 4 REBAR







CONNECTING PIN DETAIL

GENERAL NOTES

1. Barriers may be used for temporary and permanent applications.
2. Provide 36" unobstructed smooth deflection area behind barrier for unanchored applications. Provide 12" unobstructed smooth deflection area behind barrier for anchored applications.
3. When anchored, install anchor pins on the side facing traffic. Precast barrier used as permanent median barrier in medians less than 8' in width shall be anchored to the roadway. When anchored in medians, install anchor pins on both sides of the barrier.
4. Provide 2" clearance between all metal reinforcement and the nearest face of concrete unless otherwise shown.
5. Normal use of precast barrier units is restricted to curvatures with radii greater than 770'.
6. Use narrow base shoulder barrier only at locations with full height backfill or equivalent structural support placed behind barrier.
7. When scuppers are not required plug them with a minimum 2" of grout.
8. Concrete grout for grouting over pins, pinning holes or grouting of scuppers shall be a non–shrinking grout, weak in strength and of thick consistency.
9. This precast concrete barrier is NCHRP 350 TL–3 approved.

REVISIONS		
Date	Description	By
4/28/10	Correct Dims, Note 1	KJS

Sheet 1 of 2

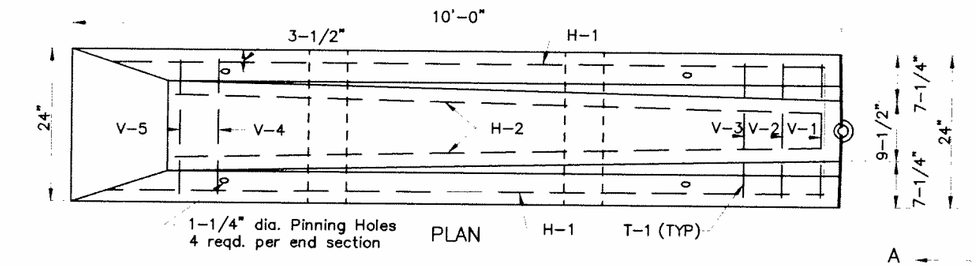
State of Alaska
Department of Transportation & Public Facilities

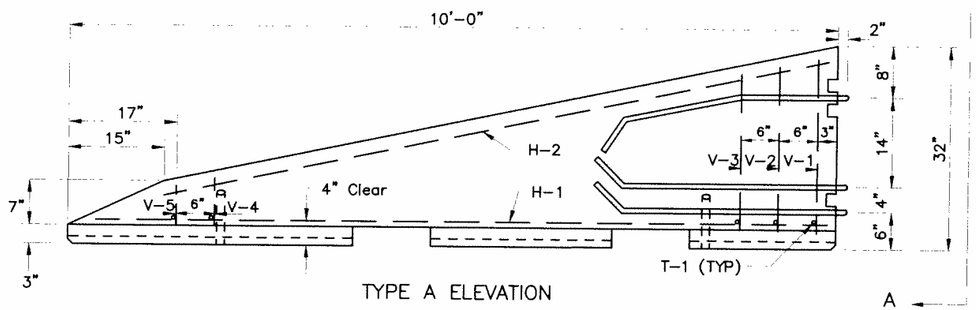
PRECAST CONCRETE "F" SHAPE BARRIER

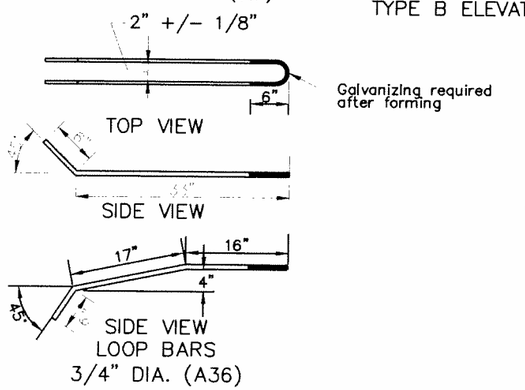
APPROVED
Date 5/31/12

G-46.11 Sheet 1 of 2

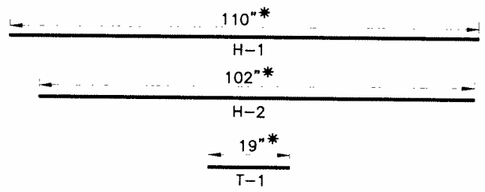
G-46.11



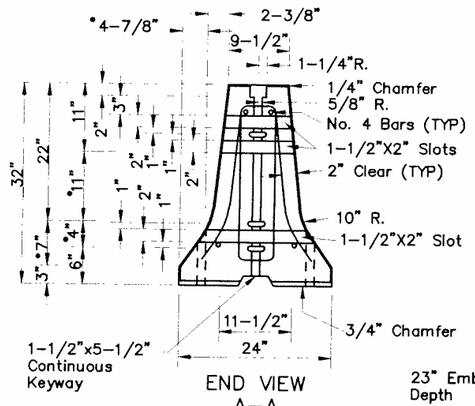


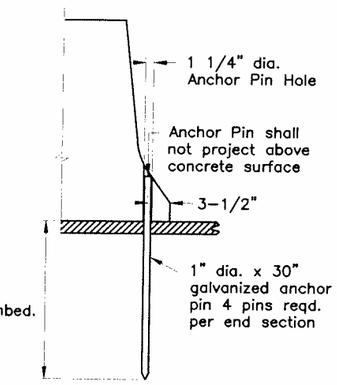


REINFORCEMENT DETAIL

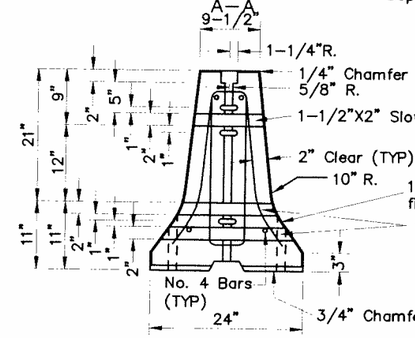


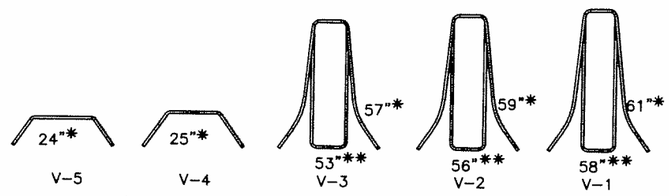
* Dimensions marked thus are to the Intersection point of the barrier slopes.





ANCHOR PIN
PLACEMENT DETAIL





*Length of No. 4 Rebar **Length of No. 4 Rebar (Inner Core)

REINFORCING STEEL

GENERAL NOTES

1. Use tapered end sections only where:
   a. Barriers terminate outside the clear zone, or
   b. The regulatory speed limit is 25 MPH or below, or 30 MPH if the Engineer determines NCHRP 350 or MASH compliant end treatments are unfeasible.
2. Use air entrained concrete with minimum compressive strength of 3,000 p.s.i.
3. Provide a minimum of two inches clear cover for reinforcing steel bars except as shown otherwise.
4. Galvanize all exposed hardware in accordance with AASHTO M 232.
5. Provide reinforcing steel bars conforming to AASHTO M 31-86, grade 60.
6. Provide anchor pins conforming to AASHTO M 183 steel.
7. Provide connecting pins conforming to AASHTO M 164-86.
8. Provide four anchor pins per unit.

REVISIONS		
Date	Description	By
4/28/10	Correct dimensioning	KJS

Sheet 2 of 2

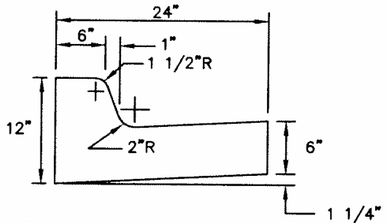
State of Alaska
Department of Transportation
& Public Facilities

PRECAST CONCRETE "F" SHAPE BARRIER TAPERED END SECTION

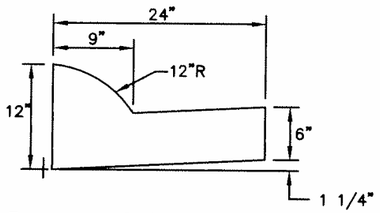
APPROVED
Date 5/31/12

4/28/10

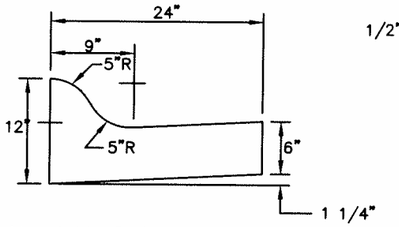
G-46.11 Sheet 2 of 2



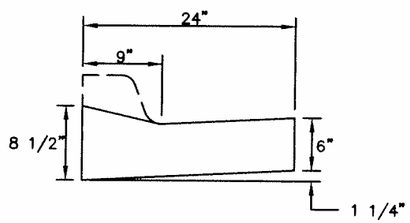
Standard Curb and Gutter



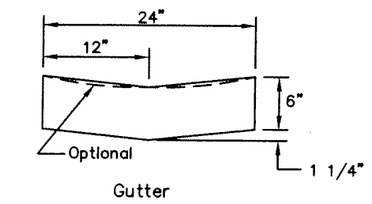
Expressway Curb and Gutter



Mountable Curb and Gutter

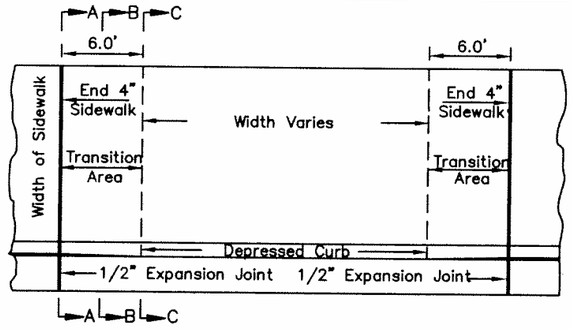


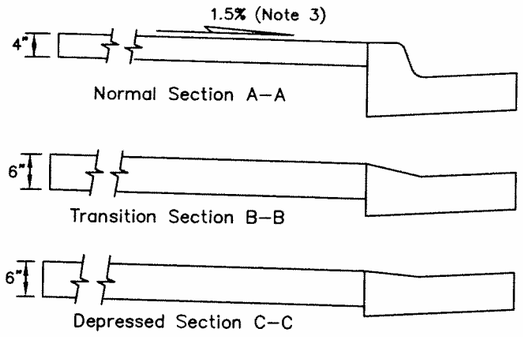
Depressed Curb and Gutter



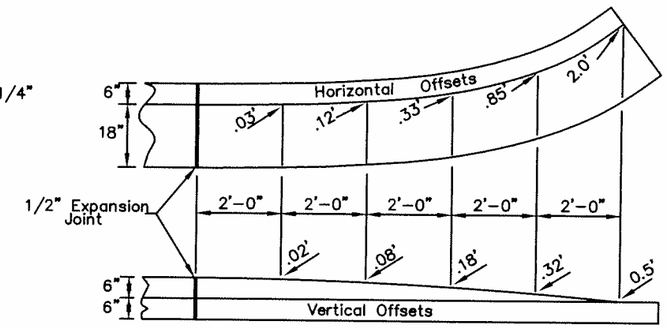
Gutter

CURB and GUTTER DETAILS

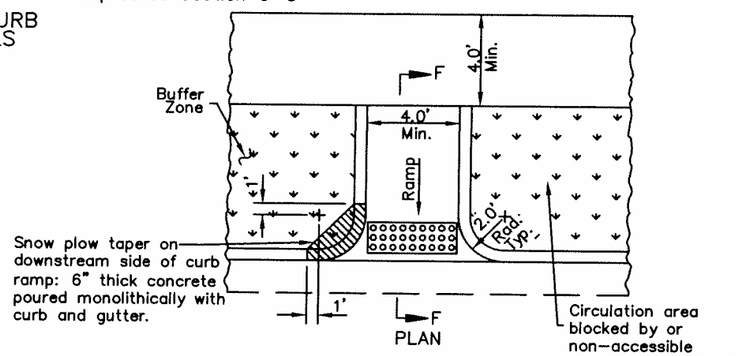


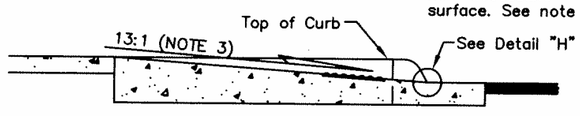


VEHICULAR CURB CUT DETAILS



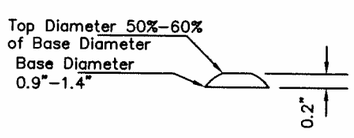
CURB and GUTTER TERMINATION TRANSITIONS



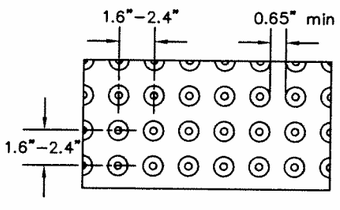


SECTION F–F

RETURNED CURB RAMP for PEDESTRIANS

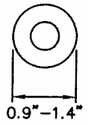


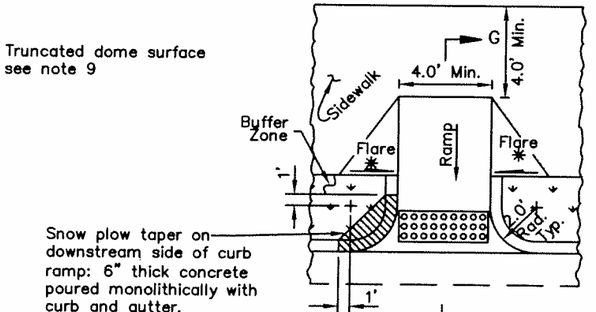
TRUNCATED DOME DETAIL

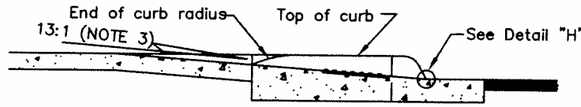


TEXTURE PATTERN DETAIL

Truncated dome surface see note 9

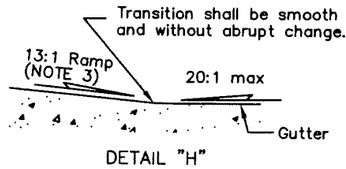






SECTION G–G

RETURNED CURB RAMP with SIDEWALK for PEDESTRIANS



DETAIL "H"

GENERAL NOTES:

1. Use the type of curb and/or gutter specified on the plans.
2. Use Mountable or Expressway curbs on medians and traffic islands.
3. Construct ramp runs and landings of concrete, regardless of whether the sidewalk is asphalt or concrete.
4. Construct ramp slopes 13:1 or flatter, flare slopes 12:1 or flatter, and sidewalk cross slopes 1.5% or flatter. If conditions require, the Engineer may increase ramp slopes to 12:1 maximum. Construct grade breaks perpendicular to ramp runs.
5. Do not construct flare slopes steeper than 10:1 measured parallel to the curb line, ramp slopes steeper than 12:1, or sidewalk cross slopes steeper than 2% (50:1), except as provided under Note 6. These are the steepest slopes allowed by law.
6. Where sidewalk slope makes it necessary to lengthen a ramp run to avoid exceeding the allowable ramp slope, do not exceed a ramp length of 15 feet. The slope resulting from that run length is acceptable, even if it exceeds the maximum slope shown.
7. Provide a coarse broomed finish on ramp runs perpendicular to the ramp slope.
8. When approved by the Engineer, curb returns may be replaced with flares at locations where access to the side of a ramp run is free of poles, utility boxes, other obstructions, or non–accessible surfaces such as a dirt planter strips. See Standard Drawing I–22 for details.
9. Install 24" detectable warning tiles for the full width of the ramp. Domes shall be in a square pattern. Align truncated dome pattern in the predominant direction of wheelchair travel to permit wheels to roll between domes.
10. 10. Construct curb ramps and detectible warning tiles in accordance with requirements for the American with Disabilities Act (ADA).

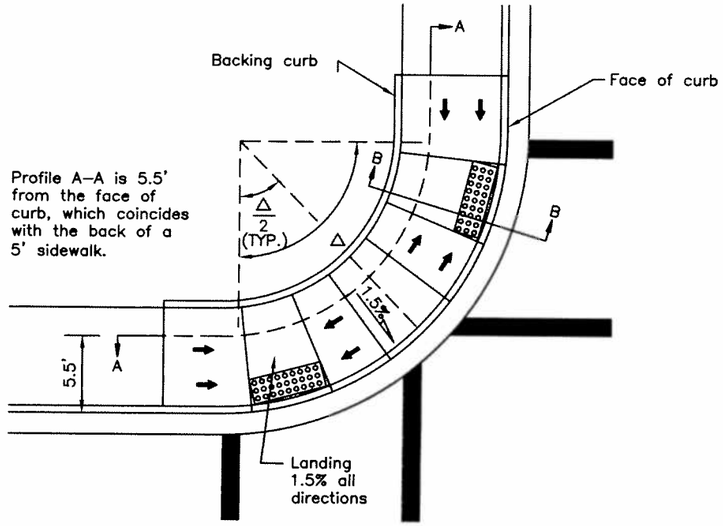
REVISIONS		
Date	Description	By
5/15/89	Added Curb Ramps	Gdo
4/1/93	Revised Detail "H"	Gdo
1/1/96	Gen. Note 3	Gdo
12/1/99	Delete Flared Ramp	KJS
5/31/12	ADA Updates	JCJ

State of Alaska
Department of Transportation & Public Facilities

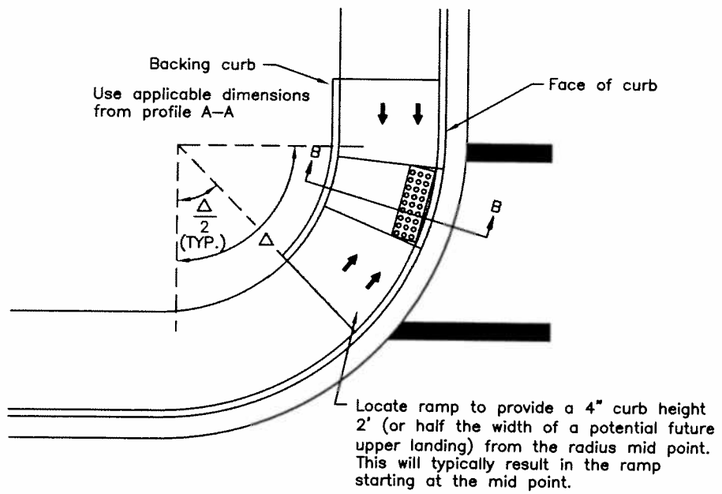
CURB CUT, CURB & GUTTER AND CURB RAMP DETAILS

APPROVED
Date 5/31/12

I-20.14

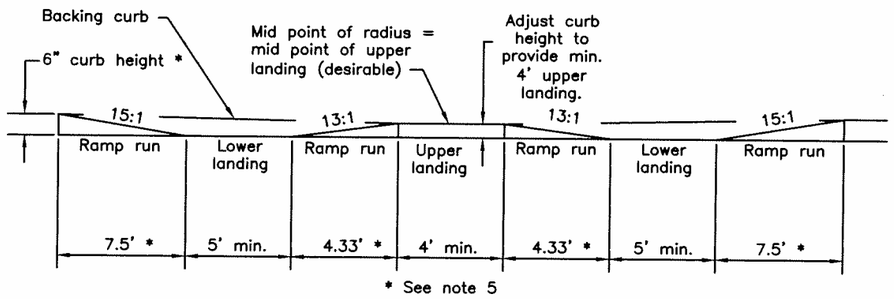


TWO CROSSING DIRECTIONS
At corner

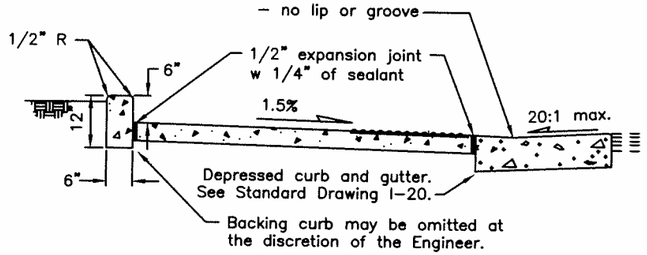


ONE CROSSING DIRECTION
At corner

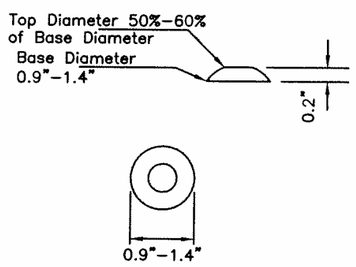
Truncated dome surface see note 12



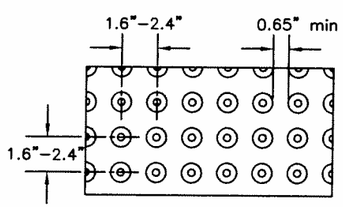
PROFILE A–A



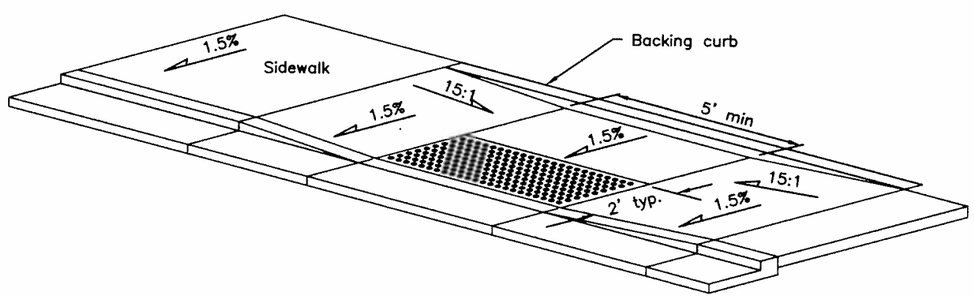
SECTION B–B



TRUNCATED DOME DETAIL



TEXTURE PATTERN DETAIL



MID–BLOCK

GENERAL NOTES

1. Parallel curb ramps are typically used when the sidewalk is at least 4' wide but not wide enough for perpendicular ramps.
2. When one curb ramp is installed in a curb radius to serve both directions of pedestrian traffic, construct it in accordance with the Mid–Block detail.
3. See plans for ramp type at particular locations.
4. Construct ramp runs and landings of concrete, regardless of whether the sidewalk is asphalt or concrete.
5. Ramp run lengths are shown for 6" curb heights and no longitudinal sidewalk slope. For other heights and slopes, increase or decrease run and flare lengths to maintain the slopes shown.
6. Construct ramp slopes 13:1 or flatter, and sidewalk cross slopes 1.5% or flatter. If conditions require, the Engineer may increase slopes in accordance with Note 7. Construct grade breaks perpendicular to ramp runs.
7. Do not construct ramp slopes steeper than 12:1 or sidewalk cross slopes steeper than 2% (50:1), except as provided under Note 8. These are the steepest slopes allowed by law.
8. Where sidewalk slope makes it necessary to lengthen a ramp run to avoid exceeding the allowable ramp slope, do not exceed a ramp length of 15 feet. The slope resulting from that run length is acceptable, even if it exceeds the maximum slope shown.
9. Provide a coarse broomed finish running perpendicular to the curb on ramp runs and upper landings and parallel to the curb on lower landings.
10. Locate lower landings within the inner edges of marked crosswalks or, if crosswalks are not marked, within the area a standard marked crosswalk would enclose. See Standard Drawing T–23 for standard crosswalk layout.
11. Drainage inlets should not be located within marked crosswalks or, if crosswalks aren't marked, within the area a standard marked crosswalk would enclose. If that is unavoidable, install accessible grates, with openings no greater than 1/2" in any direction.
12. Install 24" detectable warning tiles for the full width of the ramp. Domes shall be in a square pattern. Align truncated dome pattern in the predominant direction of wheelchair travel to permit wheels to roll between the domes.
13. Construct curb ramps and detectible warning tiles in accordance with requirements for the American with Disabilities Act (ADA).

REVISIONS		
Date	Description	By
2/28/03	Added det. warnings	TGM
5/31/12	ADA Updates	KCJ

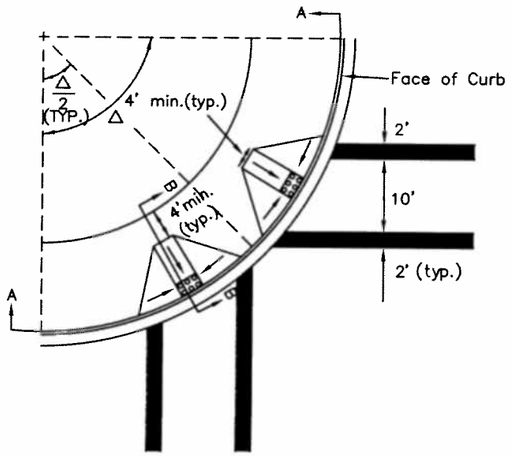
Sheet 1 of 1

State of Alaska
Department of Transportation & Public Facilities

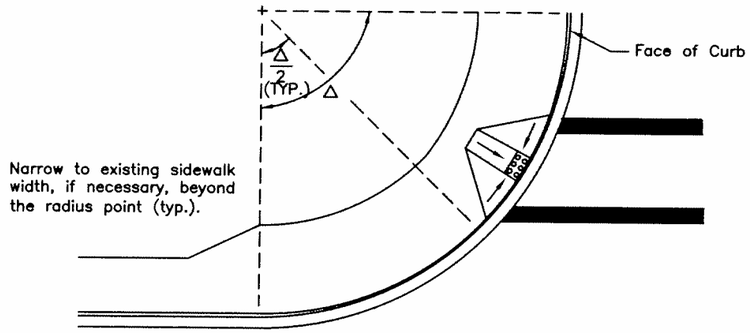
PARALLEL CURB RAMP

APPROVED
Date 5/31/12

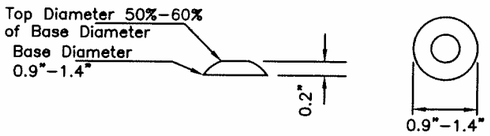
I-21.02



TWO CROSSING DIRECTIONS
At corner

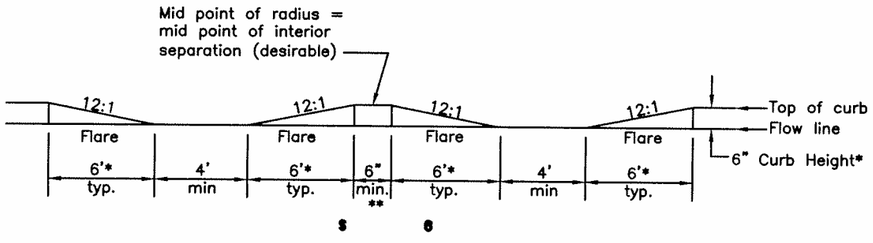


ONE CROSSING DIRECTION
At corner



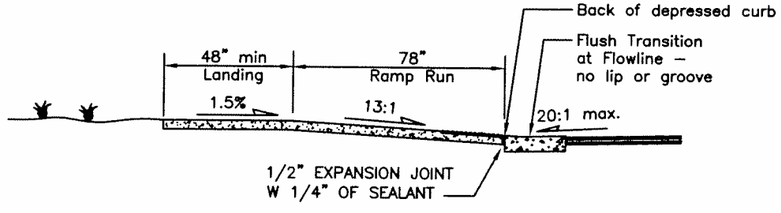
TRUNCATED DOME DETAIL

TRUNCATED DOME SURFACE
SEE NOTE 14

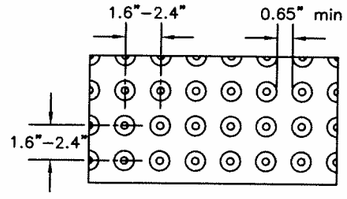


PROFILE A–A

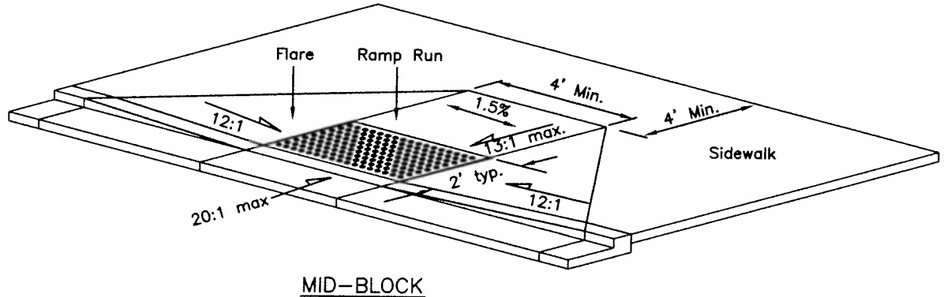
** Adjust width of inner separation to keep ramp runs within the inner edges of marked crosswalks or, if crosswalks are not marked, within the area a standard marked crosswalk would enclose.



SECTION B–B



TEXTURE PATTERN DETAIL



MID–BLOCK

GENERAL NOTES

1. Perpendicular curb ramps require approximately 12' of sidewalk width. Use parallel or combination parallel/perpendicular curb ramps for narrower widths.
2. When one curb ramp is installed in a curb radius to serve both directions of pedestrian traffic, construct it in accordance with the Mid–Block detail.
3. See plans for ramp type at particular locations.
4. Ramp runs shall be perpendicular to the face of curb.
5. Construct ramp runs, flares, and upper turning space of concrete, regardless of whether the sidewalk is asphalt or concrete.
6. Ramp run and flare lengths are shown for 6" curb heights shown and no longitudinal sidewalk slope. For other heights and slopes, increase or decrease run and flare lengths to maintain the slopes shown.
7. Construct ramp slopes 13:1 or flatter, flare slopes 12:1 or flatter, and sidewalk cross slopes 1.5% or flatter. If conditions require, the Engineer may increase slopes in accordance with Note 8. Construct grade breaks perpendicular to ramp runs.
8. Do not construct ramp slopes steeper than 12:1, flare slopes steeper than 10:1 measured parallel to the curb line, or sidewalk cross slopes steeper than 2% (50:1), except as provided under Note 9. These are the steepest slopes allowed by law.
9. Where sidewalk slope makes it necessary to lengthen a ramp run to avoid exceeding the allowable ramp slope, ramp shall not exceed 15 feet. The slope resulting from that run length is acceptable, even if it exceeds the maximum slope shown
10. Provide a coarse broomed finish running parallel to the curb on ramp runs and flares.
11. Provide turning space (4'x4' min.) at the top of curb ramps. Provide clear area (4'x4' min) beyond the bottom grade break within the inner edges of marked crosswalks or, if crosswalks are not marked, within the area a standard marked crosswalk would enclose. See Standard Drawing T–23 for standard crosswalk layout.
12. Drainage inlets should not be located within marked crosswalks or, if crosswalks are not marked, within the area a standard marked crosswalk would enclose. If that is unavoidable, install accessible grates, with openings no greater than 1/2" in any direction.
13. When approved by the Engineer, flares may be replaced with a curb at locations where access to the side of a ramp run is blocked by poles, utility boxes, other obstructions, or by a non–accessible surface such as a dirt planter strip. See Standard Drawing I–20 for details.
14. Install 24" detectable warning tiles for the full width of the ramp. Arrange domes in a square pattern. Align truncated dome pattern in the predominant direction of wheelchair travel to permit wheels to roll between the domes.
15. 15. Construct curb ramps and detectible warning tiles in accordance with requirements for the American with Disabilities Act (ADA).

REVISIONS		
Date	Description	By
2/28/03	Added det. warnings	TCM
5/31/12	ADA Updates	KJ

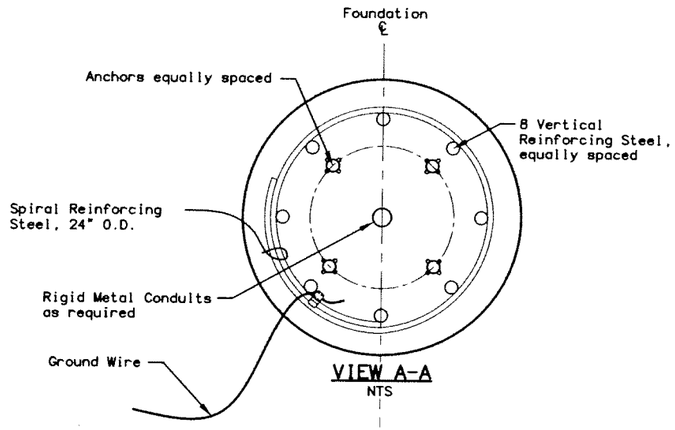
Sheet 1 of 1

State of Alaska
Department of Transportation & Public Facilities

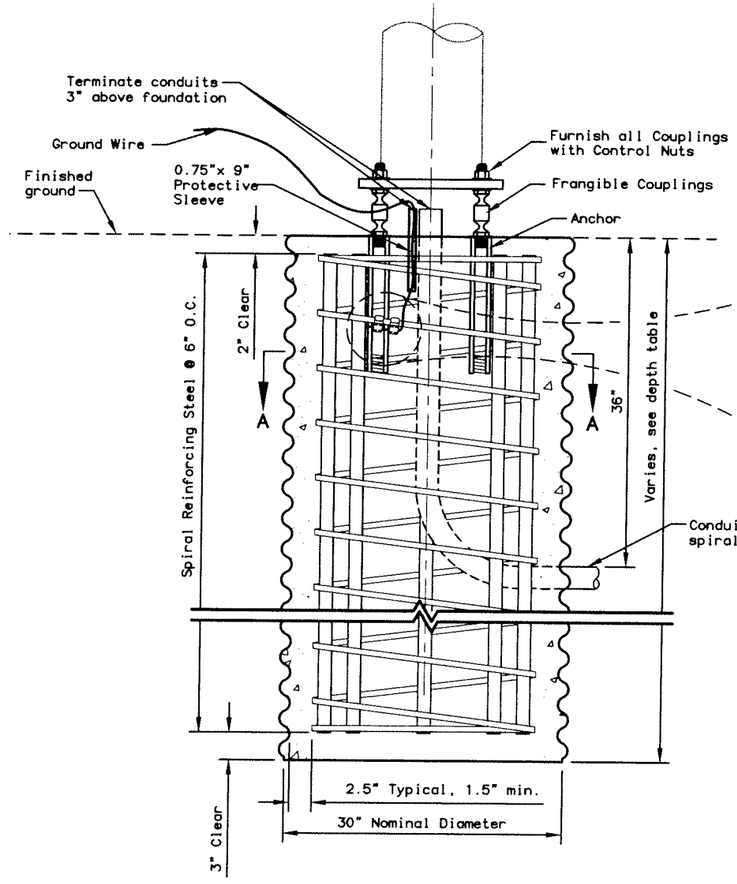
PERPENDICULAR CURB RAMP

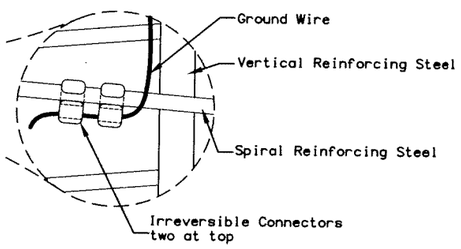
APPROVED
Date 5/31/12

I-22.02



VIEW A-A
NTS





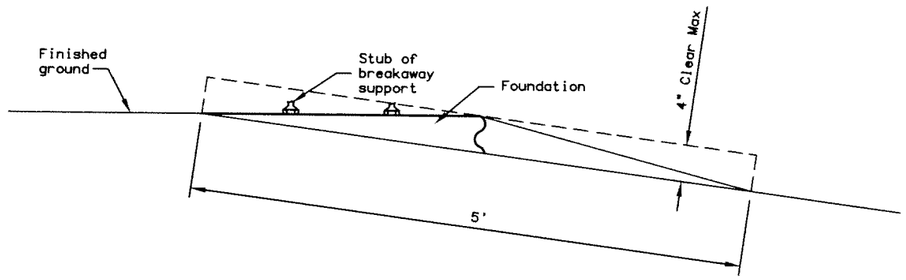
FOUNDATION DETAILS
NTS
(Skirt omitted for clarity)

MATERIAL REQUIREMENTS		
Concrete	Class A	f'c = 4000 psi
CMP	AASHTO M218	14 ga.
Vertical Reinforcing Steel	AASHTO M31 #11	GR 60
Spiral Reinforcing Steel	AASHTO M31 #5	GR 60
Ground Wire		#4 awg
Frangible Coupling	NCHRP 350 TL3 Frangible Coupling	Vu = 5.5 kips Tu = 43.2 kips
Anchor	NCHRP 350 TL3 Frangible Coupling Anchor	
Conduit	Sch 40	RMC
Protective Sleeve	Sch 40	PVC

DEPTH TABLE		
GRADE	FOUNDATION DEPTH BY APPLICATION (ft.)	
	ELECTROLIER * SEE NOTE 9	BREAKAWAY TRAFFIC SIGNAL
Flat to 6:1	8	6
>=6:1 to 3:1	9	7
>=3:1 to 1.5:1	10	8

SAND SLURRY MIX DESIGN		
ITEM	BATCHING QUANTITIES PER CYD BATCH (lbs.)	APPLICABLE SPECS.
Portland Cement Concrete	188	701-2.01
Water (52.1 gal.)	435	712-2.01
Fine Aggregate SSD	3041	703-2.01
Admixture: Microair	2.0 oz.	711-2.02
Total	3664	

BOLT CIRCLE	
REGION	DIAMETER
Northern Region Projects	14.5"
Central Region Projects	15.5"
Southeast Region Projects	15.5"



CLEARANCE DETAIL
NTS

DESIGN NOTES:

Design Standard: 2001 Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals with 2006 interim.

Design Load: 1,000 lbs axial, 2,000 lbs shear, 50,000 ft-lbs moment.

Construction Standard: Latest edition of the State Of Alaska Standard Specifications for Highway Construction with Special Provisions.

NOTES:

1. This foundation is approved for electrolier and breakaway traffic signal applications in cohesionless soils with an N1-60 value of 10 or greater per AASHTO T-206, "Standard Penetration Test" (SPT). This foundation shall not be used if any of the following are encountered; water table above the bottom of foundation, very loose soils, organic soils, cohesive soils (clay), or soils susceptible to frost jacking. If any of these conditions are encountered, stop foundation work and contact the Engineer.
2. Place foundation in drilled or excavated hole with centerline of foundation located at the station, offset, and elevation specified in plans. Set foundation to satisfy the conditions depicted in clearance detail.
3. Form the foundation in corrugated metal pipe conforming to Subsection 707-2.01 of the Specifications.
4. Provide 1.5 extra turns at each end of the spiral reinforcing steel. Reinforcing steel shall not be spliced. Tie vertical reinforcing steel to each intersection of the spiral reinforcing steel.
5. Connect ground wire near the top of spiral reinforcing steel with two irreversible connectors as shown. Fasten connectors according to the manufacturers' recommendations including the use of manufacturer specified tools. The ground wire may be bare solid, stranded, or braided copper. Protect ground wire with protective sleeve as shown and fill with silicon sealant.
6. Complete all concrete work in conformance with Sections 501, 503, and 660 of the Specifications. Use a tube with a hopper head or other approved device when dropping concrete more than 5 feet per Subsection 501-3.08. Vibrate concrete during placement by mechanical vibration per Subsection 501-3.08. Ensure anchor threads are protected from contact with concrete during pour.
7. Backfill and compact according to Section 205, and Subsections 203-3.04 and 660-3.01 of the Specifications. Use select material, Type A or sand slurry as backfill material. Ensure area below foundation meets compaction requirements and is free of loose material and debris prior to concrete work.
8. Install all anchors according to the manufacturer's written installation instructions. Anchors shall be installed plumb. Anchors greater than 1:40 out-of-plumb will result in foundation rejection.
9. When used for electrolier reduce the foundation depth 1 foot when there is no luminaire arm or the luminaire arm is less than or equal to 12 feet.
10. Grade in depth table refers to fill slopes. If foundation is in a cut slope assume flat grade in table. To determine grade in fill slopes, use the most severe grade found within an 8 foot radius of the center of the foundation. Slopes steeper than 1.5:1 require engineered depth calculation.

REVISIONS		
Date	Description	By

SHEET 1 OF 1

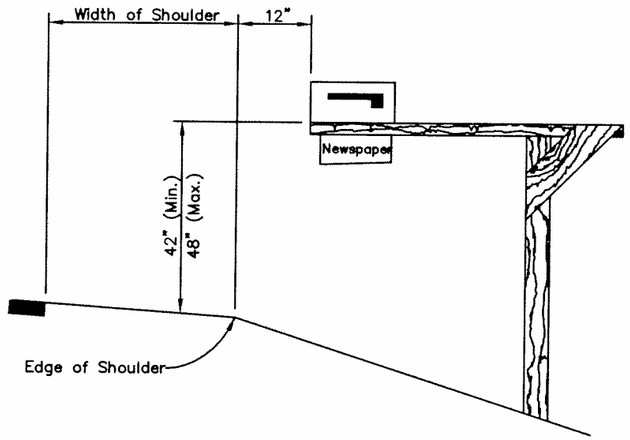
State of Alaska
Department of Transportation
& Public Facilities

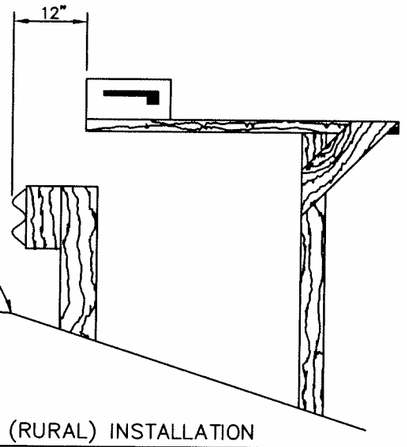
CONCRETE STREET LIGHT POLE FOUNDATION

APPROVED
STATE OF ALASKA 49TH
Charles M. Wagner CE 11156
REGISTERED PROFESSIONAL ENGINEER
Date 05/31/12

M-20.13

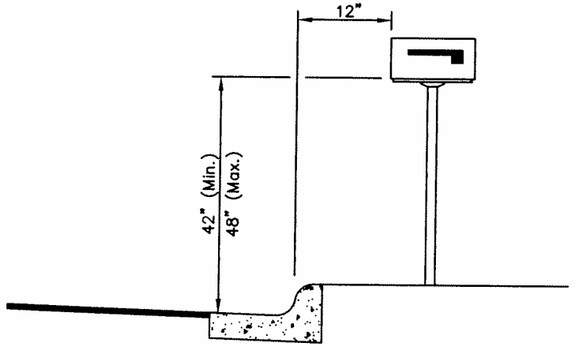
SHEET 1 of 1





WOOD POST (RURAL) INSTALLATION

Single or Double Box



METAL POST (URBAN) INSTALLATION

Single or Double Box

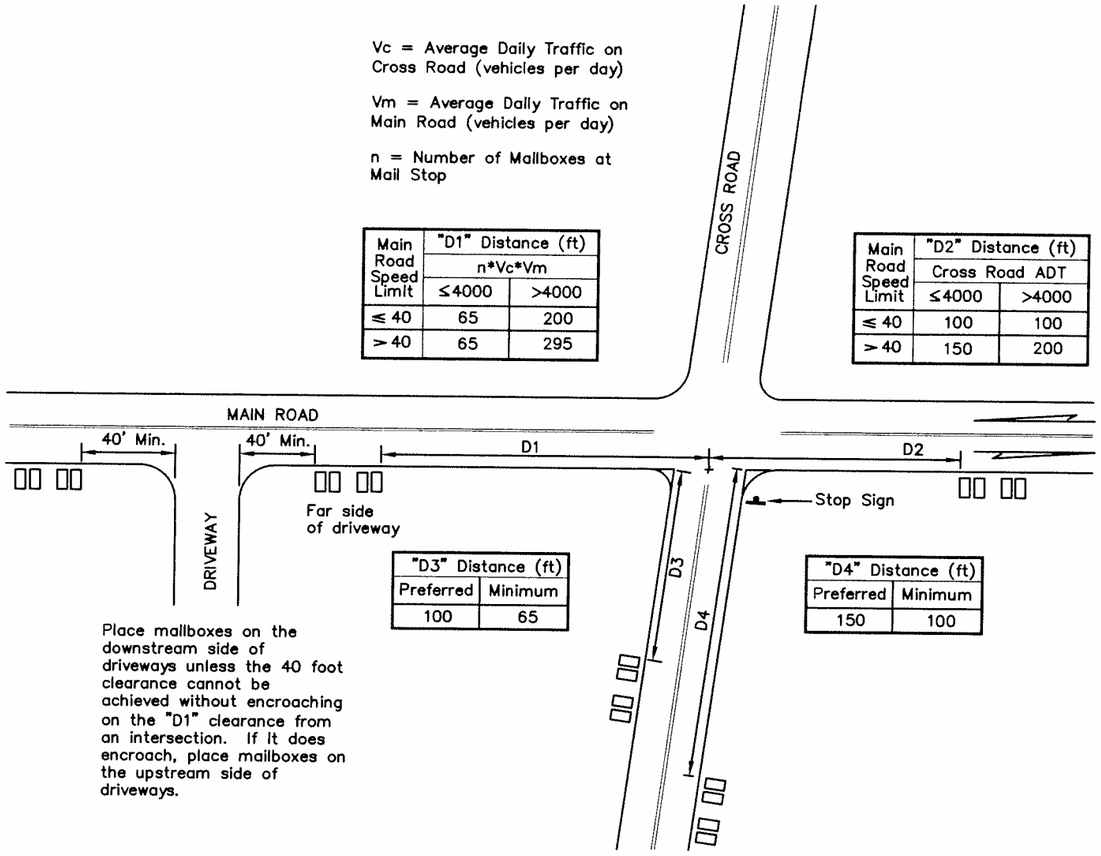
Vc = Average Daily Traffic on Cross Road (vehicles per day)

Vm = Average Daily Traffic on Main Road (vehicles per day)

n = Number of Mailboxes at Mail Stop

Main Road Speed Limit	"D1" Distance (ft) n*Vc*Vm	
	≤4000	>4000
≤ 40	65	200
> 40	65	295

Main Road Speed Limit	"D2" Distance (ft) Cross Road ADT	
	≤4000	>4000
≤ 40	100	100
> 40	150	200

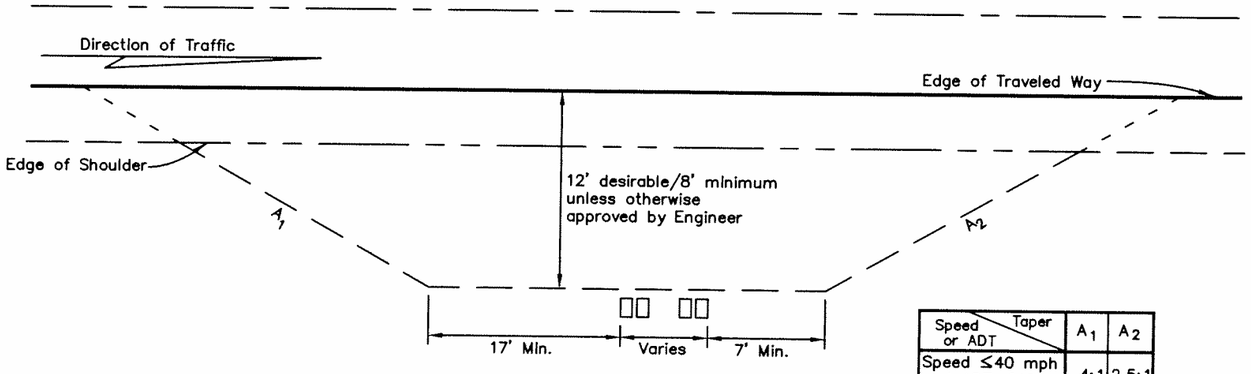


"D3" Distance (ft)	
Preferred	Minimum
100	65

"D4" Distance (ft)	
Preferred	Minimum
150	100

Place mailboxes on the downstream side of driveways unless the 40 foot clearance cannot be achieved without encroaching on the "D1" clearance from an intersection. If it does encroach, place mailboxes on the upstream side of driveways.

MAILBOX LOCATION AT INTERSECTIONS AND DRIVEWAYS



TURNOUTS FOR GROUPED BOXES

Speed or ADT \ Taper	A_1	A_2
Speed ≤40 mph and ADT ≤400	4:1	2.5:1
Speed >40 mph or ADT >400	20:1	12:1

TURNOUT TAPERS

GENERAL NOTES:

1. Install mailboxes conforming to U.S. Postal Service requirements.
2. Install mailbox supports conforming to Standard Drawing M-23.
3. Mailbox supports shall not present a rigid, unyielding impact resistant hazard to road traffic, but shall be flexible and yielding to vehicular impact. Install crashworthy supports in accordance with Standard Drawing M-23.
4. Installation shall be on the right side of roadway in the direction of mail carrier travel with the exception of one-way streets where they may be placed on either side.
5. Locate mailboxes to minimize dangers to road traffic, carriers and postal recipients.
6. Provide a minimum shoulder width of 8' unless otherwise approved by Engineer. Install single and double mailbox supports separated by at least 3', and desirably 4', from each other. More than two boxes on a single support is allowable only as shown on M-23.
7. Newspaper receptacles shall conform to the same setback and support regulations as mailboxes. Where newspaper receptacles and mailboxes are to be mounted together, the newspaper receptacle may be mounted beneath the mailbox or on the side of the mailbox support opposite the reflecting marker.

REVISIONS		
Date	Description	By
4/1/93	Gen. Note 8	Gdo
1/1/96	Revise Min. Height	Gdo
4/28/10	Tables, detail, notes	KJS

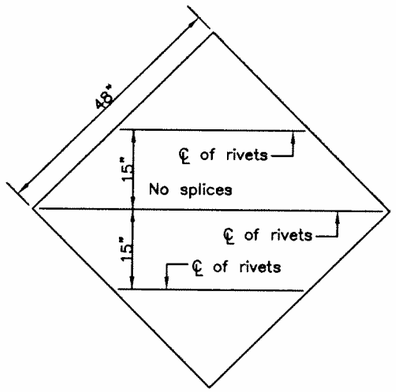
State of Alaska
Department of Transportation & Public Facilities

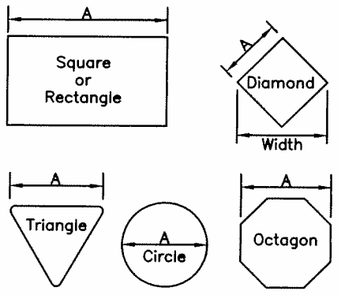
MAILBOX LOCATION

APPROVED

Date 5/31/12

M-20.13

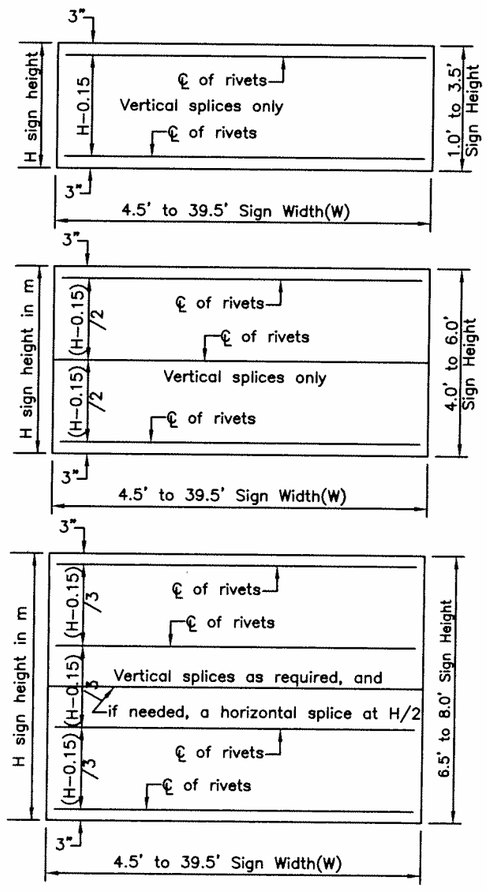




Maximum size unframed signs using 0.125" thick aluminum sheeting.	
Sign Shape	A
Squares, Shields, and Route Markers	48"
Rectangles	48"
Diamonds	48"
Triangles	48"
Rounds and Octagons	48"

Install wind framing on all signs that exceed the dimensions listed.

LIGHT SIGNS



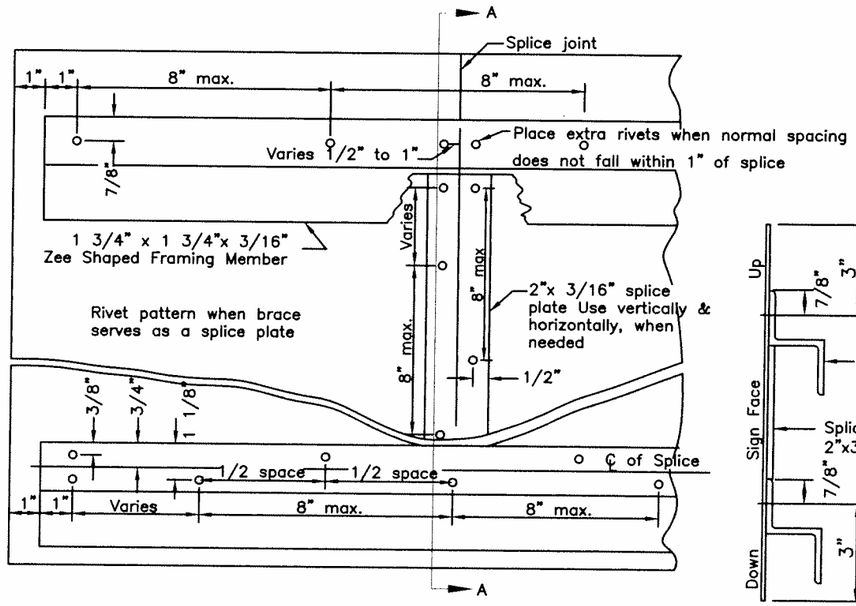
WIND FRAMING LOCATIONS

TUBE SIGN POST SPACING

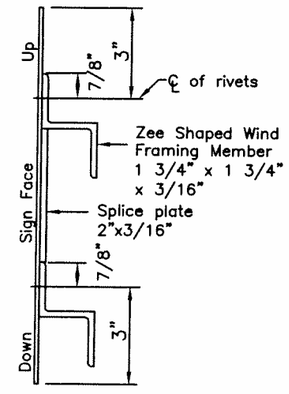
Sign Width (feet)	No. of Posts	Distance Between Posts	Sign Overhang	Post Type				Notes
				P.S.T.	Wood	Steel Tube	W–Shape	
0.5 to 4.0	1	–	0.5W	X	X	X		See Note 2.
4.5 to 10.0	2	0.6W	0.2W	X	X	X		See Note 3.
10.5 to 11.0	2	6	Varies	X	X	X		See Note 3.
11.5 to 13.0	2	8	Varies				X	
13.5 to 20.0	2	0.6W	0.2W				X	
20.5 to 22.5	3	8	Varies				X	
23.0 to 29.5	3	0.35W	0.15W				X	
30.0 to 31.5	4	8	Varies				X	
32.0 to 40.0	4	0.25W	0.125W				X	

SIGN POST SPACING NOTES:

1. Install sign support in accordance with the table above, unless otherwise required by plans or specifications.
2. Exceptions:
   a. Use one post for all E5–1 gore signs, regardless of width.
   b. Use one 2.5" P.S.T. for all STOP signs, with or without street name signs.
3. Supports placed within 7' of each other must be acceptable for that use. See Standard Drawing S–30 for the sizes of wood posts and P.S.T.s that may be used within 7'. See Manufacturer's documentation for breakaway couplings and tubes that may be used within 7'.
4. See Standard Drawing S–31 for frangible couplings, hinges, and foundations for tube and W–shape sign supports.



RIVET DETAIL FOR ZEE SHAPED WIND FRAMING & SPLICE PLATE



SECTION A–A

GENERAL NOTES

1. See the standard specifications for the aluminum alloys that you may use for sign sheeting and wind framing members.
2. Fabricate all signs from 0.125" thick aluminum sheeting.
3. Sign fabricators may use alternates to the zee shaped framing member with approval of the engineer, if the frame manufacturer certifies their design equals or exceeds the strength of the zee shaped design.
4. Install one piece wind framing members on all signs up to 23.5' wide. Use one splice in each wind frame on all signs wider than 23.5'. Locate splices at least 18" from all posts and panel edges. Stagger splices in adjacent framing members at least 8.0' apart.
5. Attach wind framing members with rivets or with an engineer approved, double sided, high strength, adhesive tape. Clean and handle sheeting and framing members and apply tape in accordance with the tape manufacturer's written instructions. Install two rivets in both ends of each framing member.
6. Use 3/16" diameter rivets conforming to aluminum alloy 6061–T6 for cold driven rivets, or aluminum alloy 6061–T43 for hot driven rivets.
7. Sign fabricators may use sign panels extruded with integral framing with approval of the engineer, if the manufacturer certifies their design equals or exceeds the strength of the 0.125" thick panel with framing attached to it.
8. Frame all signs taller than 8.0' with five wind framing members located (H–0.15)/4 spaces. If needed, make a horizontal splice at the middle wind frame.
9. Do not use round pipes for sign supports.

REVISIONS		
Date	Description	By
4/28/10	Delete pipe, rev notes	KJS

Sheet 1 of 1

State of Alaska
Department of Transportation & Public Facilities

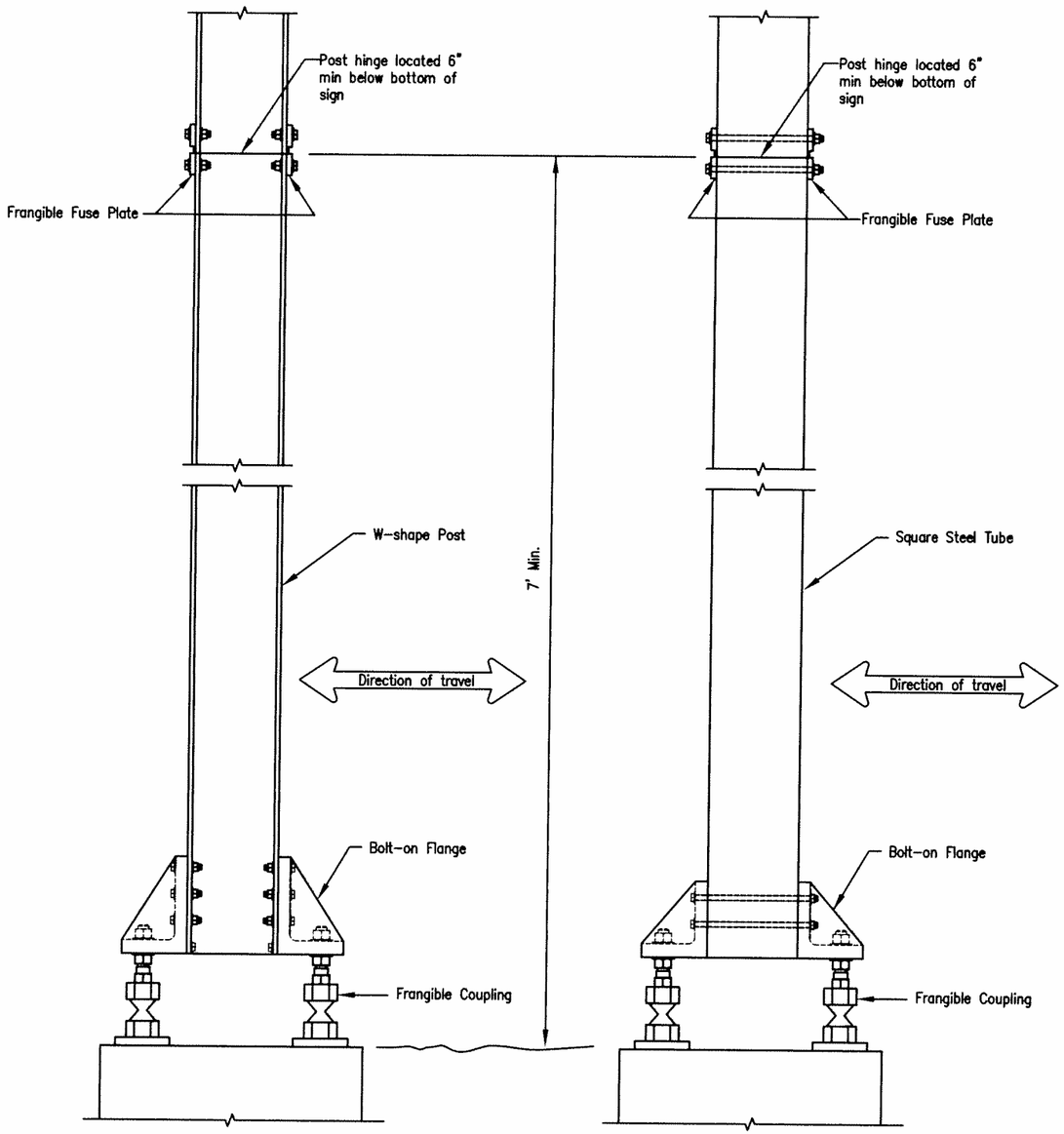
SIGN FRAMING AND POST SPACING

APPROVED
Date 5/31/12

S-00.11

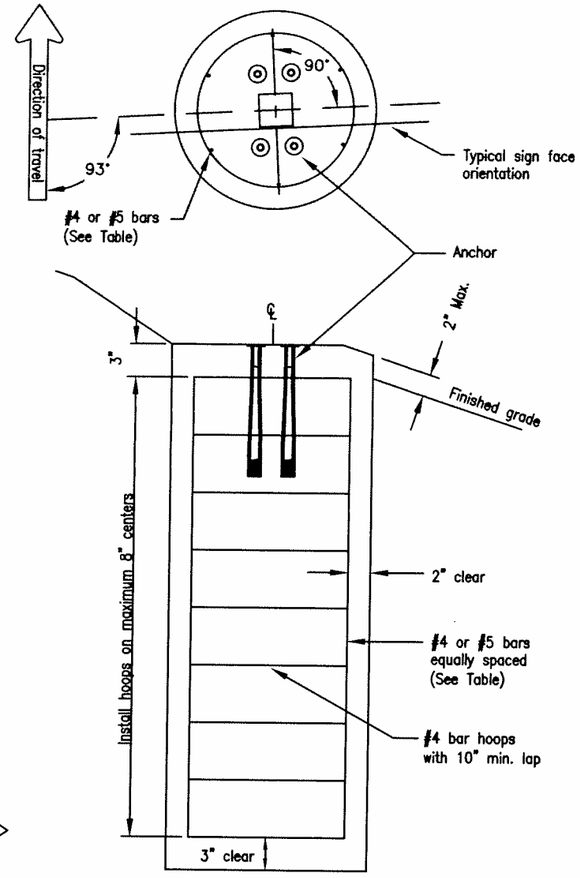
S-31.01

NOTE:
Install hinges when more than one post is used to support a sign. Do not install hinges on single post installations.



FRANGIBLE COUPLING SYSTEM FOR W-SHAPE POST

FRANGIBLE COUPLING SYSTEM FOR SQUARE STEEL TUBES



SIGN POST FOUNDATION

See Table for depth and diameter

POST SIZE & TYPE	FOUNDATION *			REINFORCEMENT					
	DIA.	MIN. DEPTH	CY^3 CONC.	VERTICAL BARS QTY.	SIZE	LGTH.	HOOPS QTY.	SIZE	DIA.
2 1/2" TUBE	1'-6"	4'-0"	0.26	6	#4	3'-6"	7	#4	1'-2"
3" TUBE	1'-6"	4'-0"	0.26	6	#4	3'-6"	7	#4	1'-2"
3 1/2" TUBE	1'-6"	4'-6"	0.30	6	#4	4'-0"	8	#4	1'-2"
4" TUBE	2'-6"	4'-0"	0.72	7	#5	3'-6"	7	#4	2'-2"
4 1/2" TUBE	2'-6"	4'-6"	0.81	7	#5	4'-0"	8	#4	2'-2"
5" TUBE	2'-6"	5'-6"	1.00	7	#5	5'-0"	9	#4	2'-2"
W6 x 9	2'-6"	4'-0"	0.95	8	#5	3'-6"	7	#4	2'-2"
W6 x 12	2'-6"	4'-6"	1.07	8	#5	4'-0"	8	#4	2'-2"
W6 x 15	3'-0"	6'-6"	1.69	8	#5	6'-0"	11	#4	2'-8"
W6 x 30	3'-0"	7'-6"	1.95	8	#5	7'-0"	12	#4	2'-8"

FOUNDATION TABLE

* Foundations sized for use where there are no loose, high moisture, or fine grained soils.

GENERAL NOTES

1. Furnish sign posts with NCHRP 350 or MASH compliant FHWA-approved frangible couplings designed to break away safely when struck from any direction. The frangible couplings shall not have specific installation torque requirements.
2. Furnish frangible coupling systems with bolt-on flanges.
3. Details on this sheet illustrate only the general components of a frangible coupling system, and are not intended to specify a particular product.
4. Install frangible fuse plates as specified by the manufacturer and hinged joints when multiple posts are used to support a sign. Do not use round pipes.
5. Install the components of the breakaway system, including hinges, in accordance with the written instructions of the system manufacturer.
6. Use Class A concrete conforming to section 501 of the Standard Specifications. Furnish ASTM A615 grade 60 steel bars for concrete reinforcement conforming to AASHTO M31.
7. Spiral reinforcing steel may be substituted for hoops in concrete foundation. Spiral option shall consist of #3 plain spiral with 6" pitch with three flat turns at the top and one flat turn at the bottom.
8. Install the concrete anchors using a rigid template. Locate the anchors on centers and within tolerances specified by the manufacturer.
9. Install the anchors in fresh concrete as recommended by the manufacturer. Adjust the template's final position until it is level. Remove and replace all foundations that need more than 2 shims under any 1 coupling or more than a total of 3 shims under any pair of couplings to plumb the post.
10. Drill the holes for attaching brackets before the sign posts are hot dip galvanized. Test fit templates in the holes to ensure the brackets can be installed square to the posts.

REVISIONS		
Date	Description	By
4/28/10	Delete pipe, Add hinge	KJS

Sheet 1 of 1

State of Alaska
Department of Transportation & Public Facilities

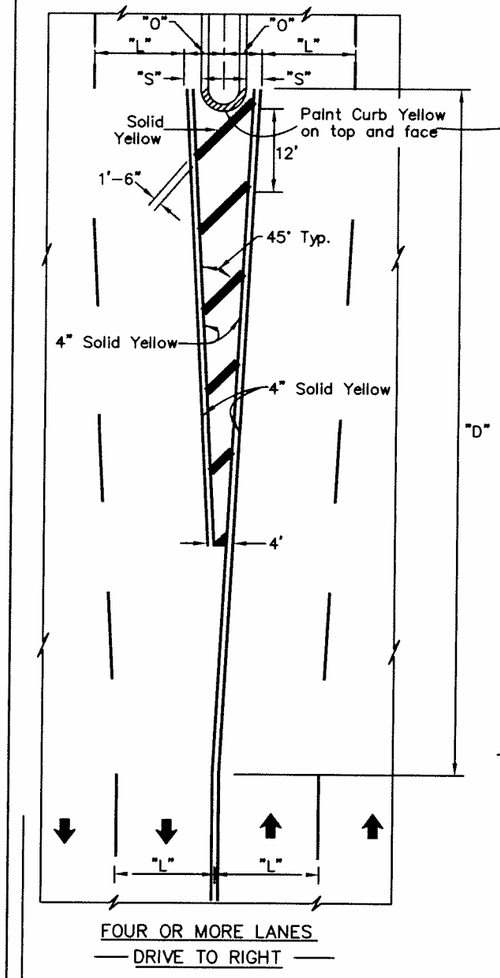
SIGN POST BASE AND FOUNDATION

APPROVED 4/28/10

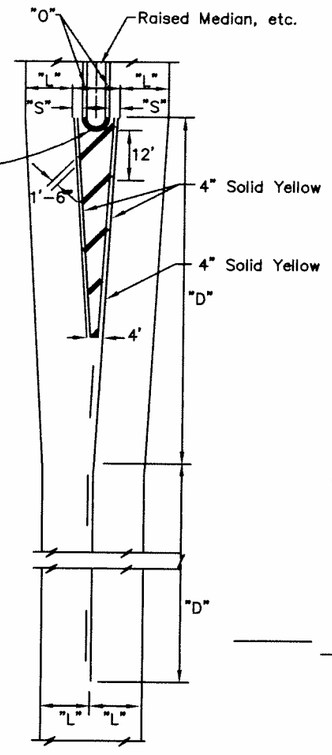
Date 5/31/12

S-31.01

T-20.03



FOUR OR MORE LANES
— DRIVE TO RIGHT —



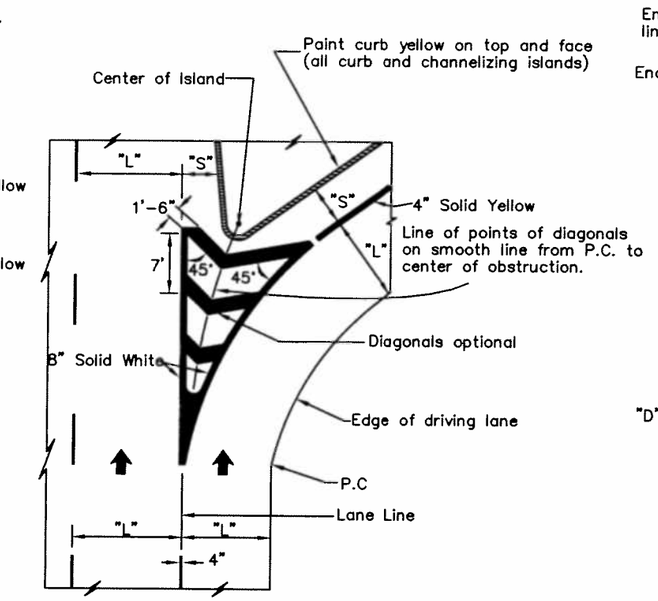
TWO LANES
— DRIVE TO RIGHT —

White longitudinal and diagonal markers identical to Four Lane Arrangement.

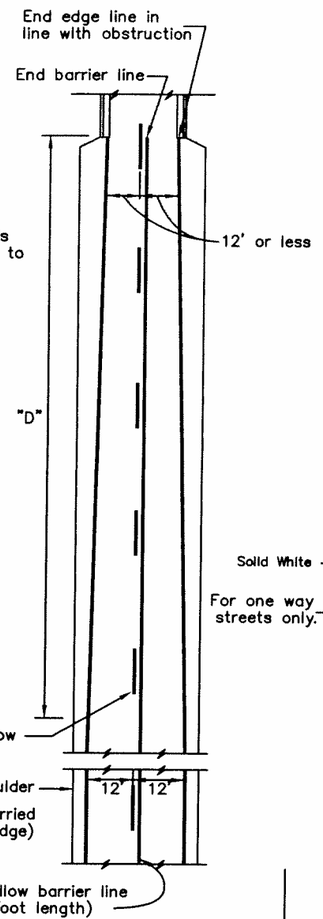
NOTES:

1. "D" = Speed limit (mph) X "0" (offset width in feet) or as indicated on the plans. Minimum "D" = 100 feet urban, 200 feet rural.

APPROACH TO OBSTRUCTIONS

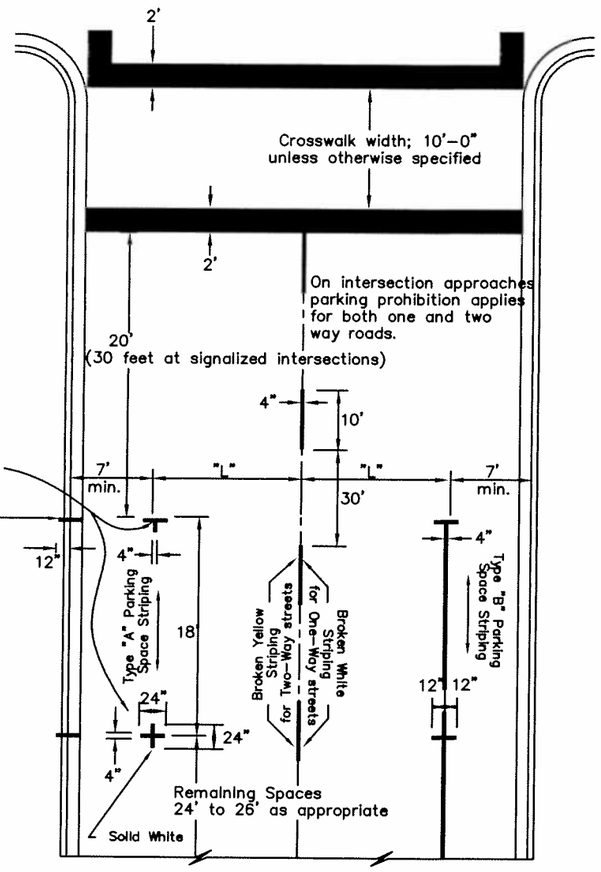


CHANNELIZING ISLAND



Note: On bridges over 24' wide use standard pavement markings. Barrier lines not used unless otherwise required.

EDGE LINE TRANSITION TO NARROW BRIDGE AND APPROACH BARRIER LINE

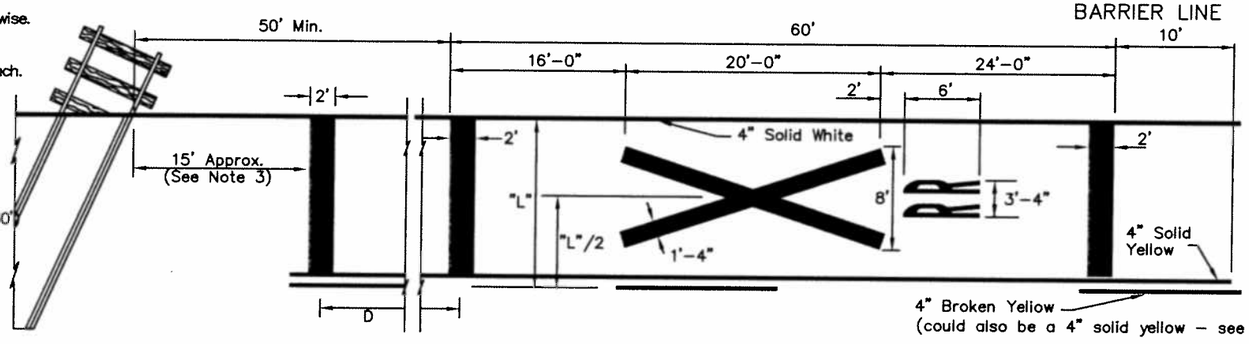


CENTERLINES FOR TWO LANE TWO WAY URBAN ROADS—PARKING LIMIT LINES

NOTES:

1. All markings solid while unless indicated otherwise.
2. On 4-lane roadways place railroad crossing approach markings in each lane of the approach.
3. Locate Stop Bar 15' from railroad track or 8' from gate, if present.
4. Place edge lines and lane lines on a uni-directional approach in a normal manner except that the lane line(s) shall be solid 4" white in lieu of broken for a distance of (D+60') in advance of the stop bands.

POSTED LIMIT	D
30 M.P.H.	225'
40	350'
50	475'
60	625'



APPROACH TO RAILROAD CROSSING ON 2 LANE 2 WAY HIGHWAY

GENERAL NOTES:

1. "S"—offset distance as designated, otherwise 1 to 2 feet.
2. "L"—driving lane width.
3. See Alaska Traffic Manual for additional instruction and/or restriction on the use of TRAFFIC CONTROL DEVICES.

NOT TO SCALE

REVISIONS		
Date	Description	By
2/15/00	Changed "RR" location	KJS
10/31/03	Correct dim / text errors	LRG
4/28/10	Notes/details to MUTCD	KJS

Sheet 1 of 1

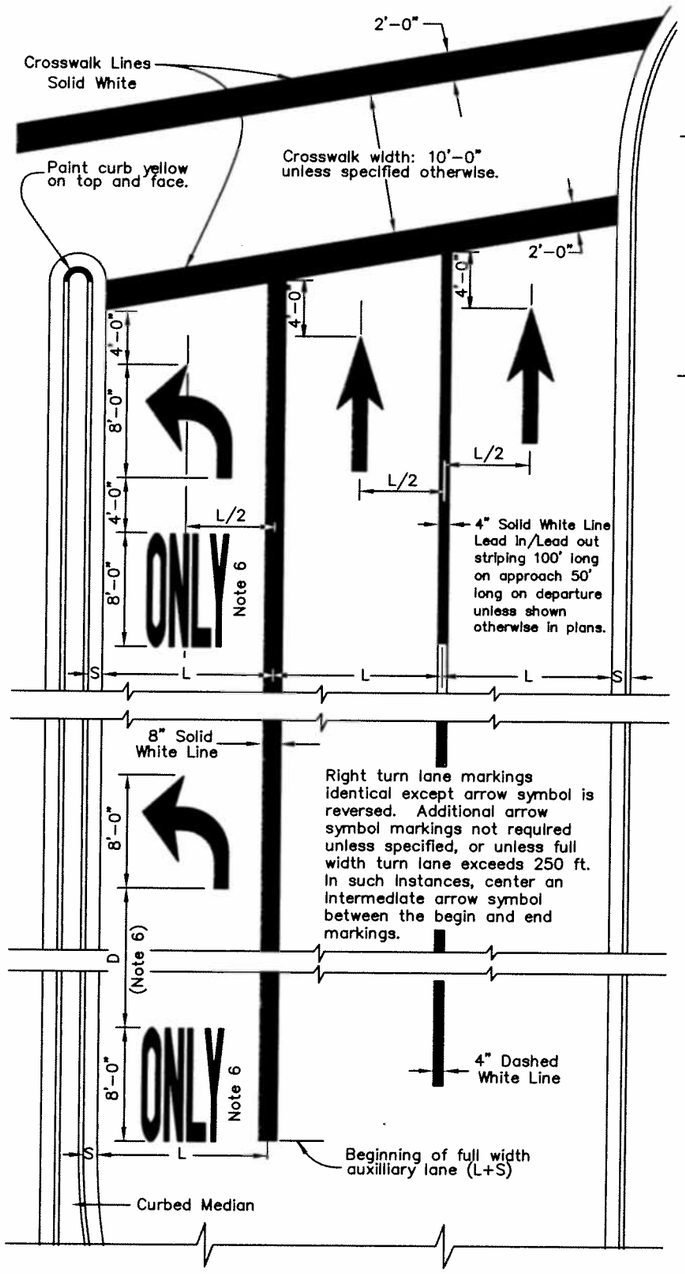
State of Alaska
Department of Transportation & Public Facilities

PAVEMENT MARKING APPLICATIONS

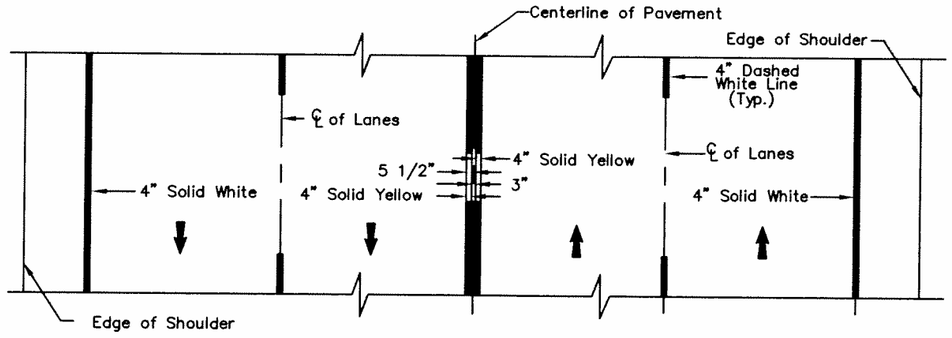
APPROVED
Date 5/31/12

T-20.03

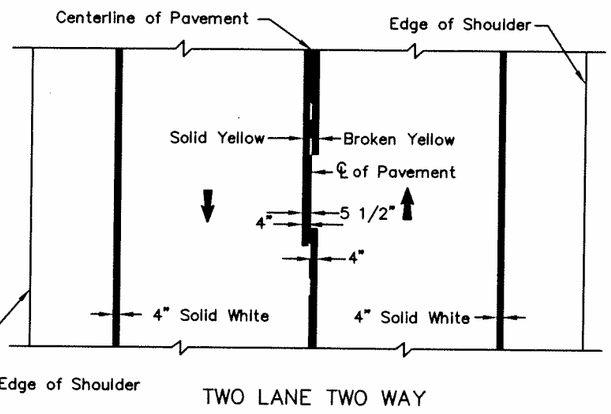
T-21.03



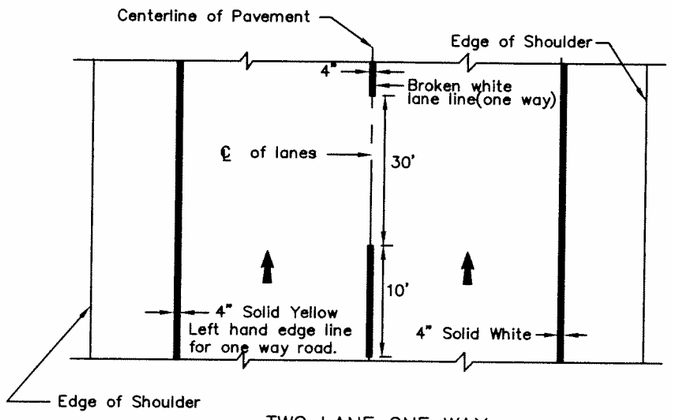
APPROACH TO INTERSECTION



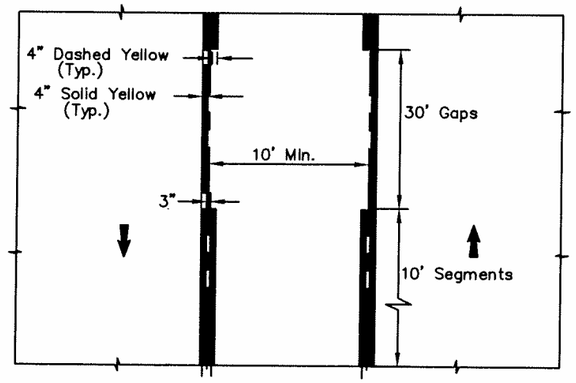
FOUR LANE TWO WAY



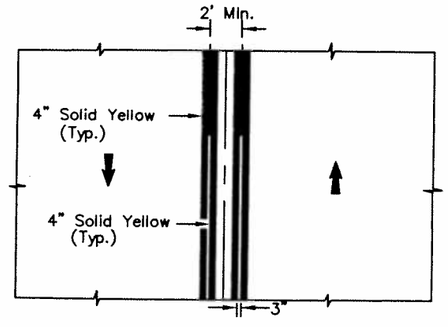
TWO LANE TWO WAY



TWO LANE ONE WAY



TWO-WAY LEFT TURN LANE



STRIPED MEDIAN

GENERAL NOTES:

1. All markings white unless indicated otherwise.
2. Lengths of stripe and gap for lane and center lines identical.
3. Lane lines for auxiliary lanes are unbroken solid lines.
4. "L" = driving lane width.
5. "S" = shy distance as shown on plans, otherwise 1 to 2 feet.
6. ONLY markings are required where through lanes change to turn lanes. In other cases, apply ONLY markings as indicated on plans.
7. See ALASKA TRAFFIC MANUAL for additional instruction on the use of TRAFFIC CONTROL DEVICES.
8. 6. Adjust distance D between ONLY and Turn Arrow based on SPEED vs. D table.

SPEED	D
25 or less	35'
30	45'
35	50'
40	60'
45	65'
50	75'
55 or more	80'

REVISIONS		
Date	Description	By
1/1/86	Arrow Dimension	Gdo
1/1/96	Intersect. Note	Gdo
4/28/10	Details, labels, notes	KJS

State of Alaska
Department of Transportation & Public Facilities

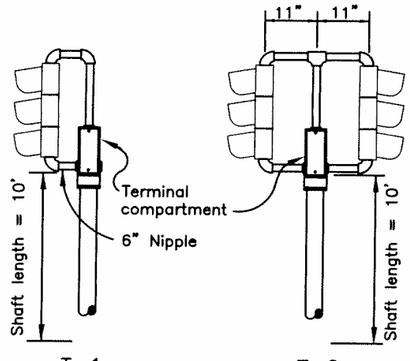
PAVEMENT MARKING APPLICATIONS

APPROVED 4/28/10

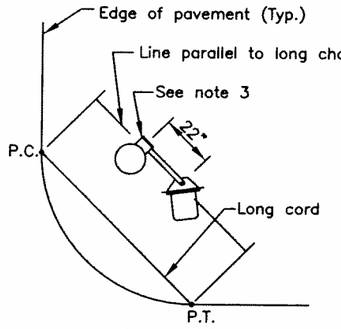
Date 5/31/12

T-21.03

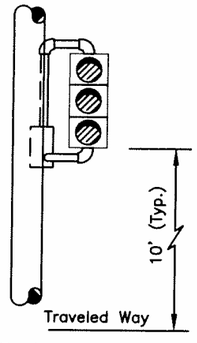
T-30.11



T-1 T-2

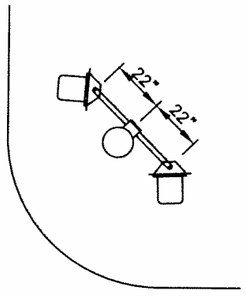


PLAN VIEW

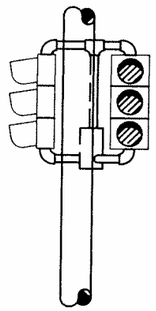


S-1

Use a one way, L.O.D. frame for installing one face

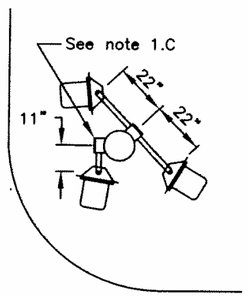


PLAN VIEW

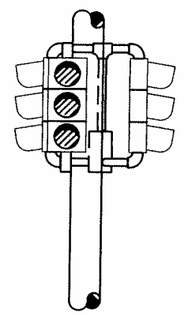


S-2

Use a two way frame for installing two faces



PLAN VIEW

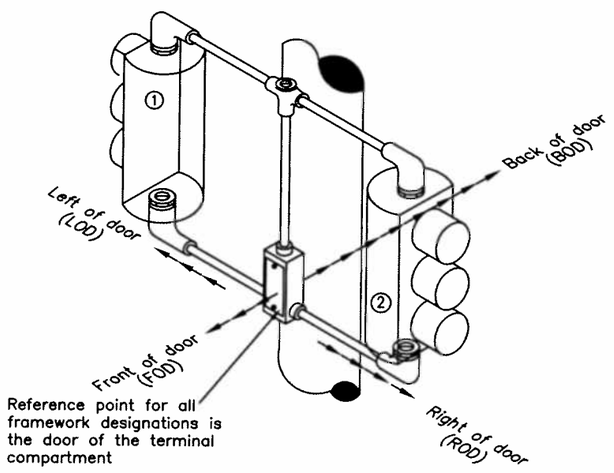


S-3

Use two frames for installing three faces: a two way and a one way R.O.D.

POST MOUNTED SIGNALS

(Shown without backplate)



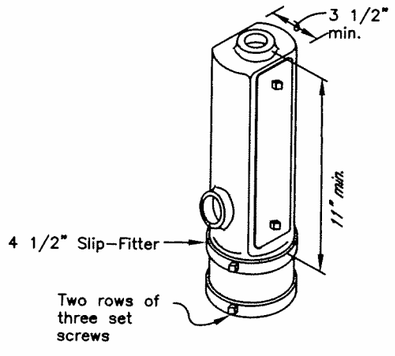
FRAMEWORK DESCRIPTION

Head no. ① offset L.O.D.

Head no. ② offset R.O.D.

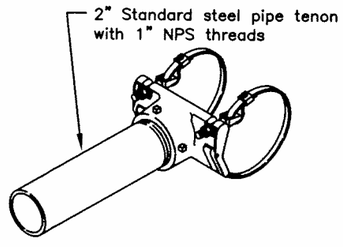
SIDE MOUNTED SIGNAL FRAMES WITH VEHICULAR SIGNALS

(Shown without backplates)



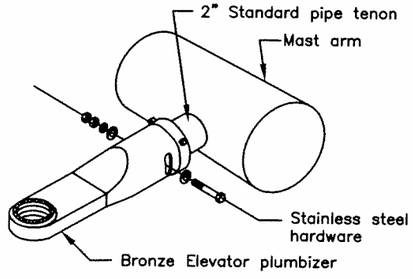
TERMINAL COMPARTMENT WITH SLIP FITTER

(See notes 1.C. and 2)



CLAMP ASSEMBLY FOR FIELD INSTALLED PLUMBIZER MOUNT

(See notes 4 and 8)



ELEVATOR PLUMBIZER

(See note 1.A.)

GENERAL NOTES

1. Install the signal faces in the plans as detailed on this sheet.
   - A. Use elevator plumbizers to install faces on mast arms and whenever 2" pipe tenons are specified. Install the plumbizer between the red and yellow signal indications.
   - B. Use signal frames to install signal faces on the sides of poles and on the tops of posts.
   - C. Use a second signal frame to install the third face when three side mounted signal faces are shown.
2. Furnish all signal frames with terminal compartments.
3. Install one terminal compartment on the side of the pole opposite the midpoint of the radius. Position the terminal compartment at the location where a line parallel to the long cord (P.C. to P.T.) of the radius is tangent to the pole.
4. Field drill the holes needed for attaching all signal hardware. Remove burrs after drilling. Treat the bare steel surfaces in accordance with AASHTO M36.
5. Provide back plates sized for the number of signal sections and mounting type, so that no light is visible between the back plate and the signal face.
6. Attach all back plates using stainless steel rivets with large flange button heads. Install 3/16" diameter by 9/16" long stainless steel rivets that provide at least 535 lb. and 675 lb. shear and tensile strengths, respectively. Bore out the mounting hole in the back plates and signal heads to the diameter recommended by the rivet manufacturer.
7. Before installing the machine screws that secure the visors, coat the threads with an anti-seizing compound.
8. Furnish clamp assemblies for field-installed plumbizer mounts with stainless steel hardware, AB-3007-L as manufactured by Pelco Products, Inc., or approved equivalent. The tenon shall be a 6" length of 2" rigid metal conduit with 1" tapered threads on one end. Drill the tenon to accept the plumbizer through bolt and debur all openings. Coat the tenon threads with Z.R.C. Galvilite, Crown-Gold Calvanizing Compound, or approved equivalent.

REVISIONS		
Date	Description	By

Sheet 1 of 2

State of Alaska
Department of Transportation & Public Facilities

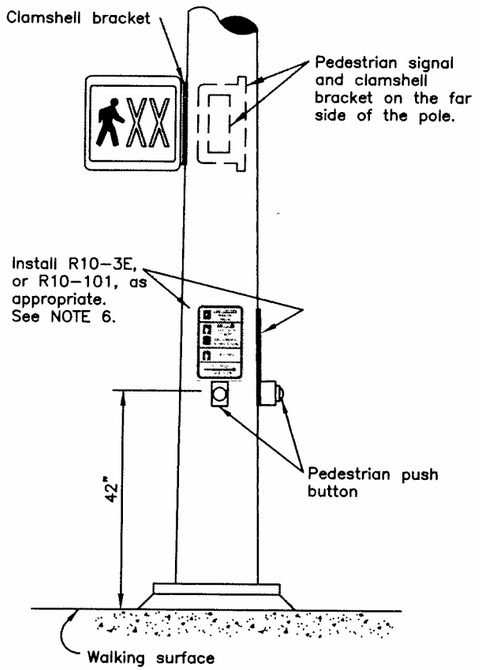
TRAFFIC SIGNAL HARDWARE

APPROVED

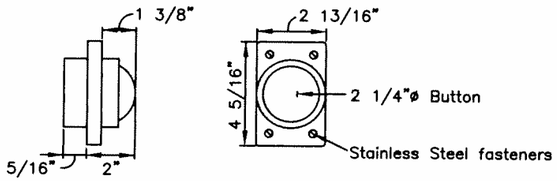
Date 5/31/12

T-30.11 Sheet 1

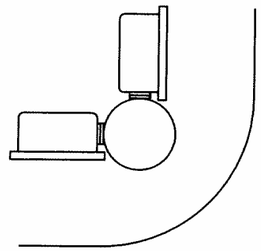
T-30.11



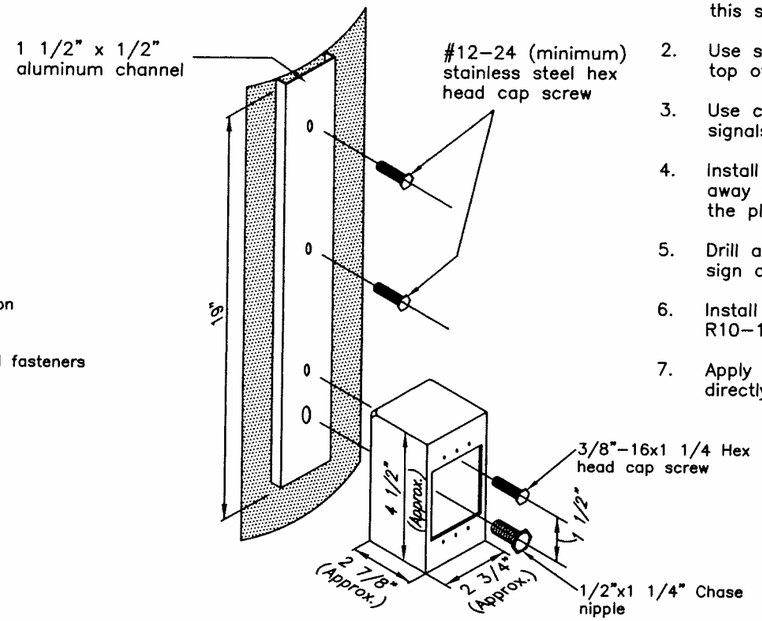
SIGNAL POLE MOUNTED PEDESTRIAN HARDWARE & SIGNAGE



PEDESTRIAN PUSH BUTTON SWITCH



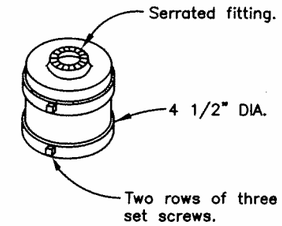
PLAN VIEW



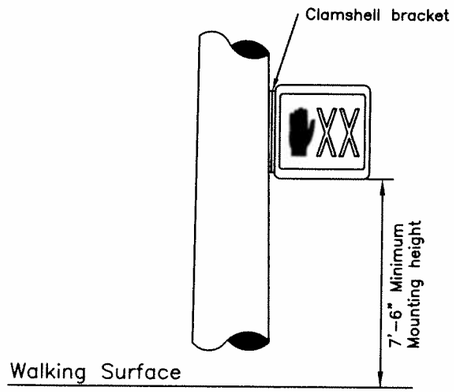
PEDESTRIAN PUSH BUTTON HOUSING

GENERAL NOTES

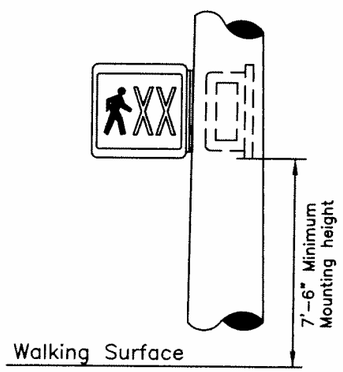
1. Install the signal faces in the plans as detailed on this sheet.
2. Use slip fitters to install pedestrian signals on the top of posts.
3. Use clamshell brackets to install all pedestrian signals except those that are post-top mounted.
4. Install pedestrian signals on the side of poles away from traffic, unless indicated otherwise in the plans.
5. Drill and tap the pole for all mounting holes for sign and pedestrian push button housing.
6. Install R10-3E if a push button is installed. Install R10-101 if no push button is installed.
7. Apply caint-seize compound to cap screws tapped directly into pole.



SLIP FITTER
(See note 2)

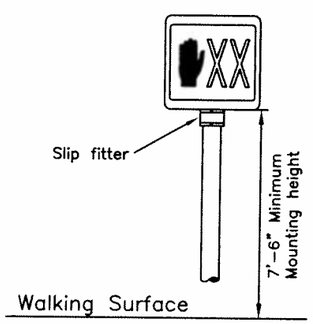


SW-1

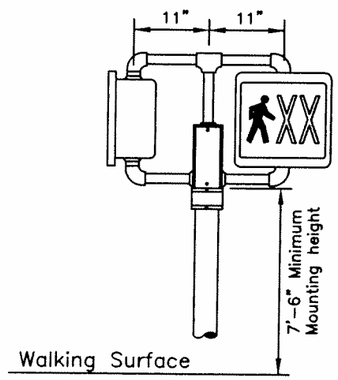


SW-2

SIDE MOUNTED SIGNALS



TW-1



TW-2

POST MOUNTED SIGNALS

REVISIONS		
Date	Description	By
4/28/10	Notes, signal, signage	KJS

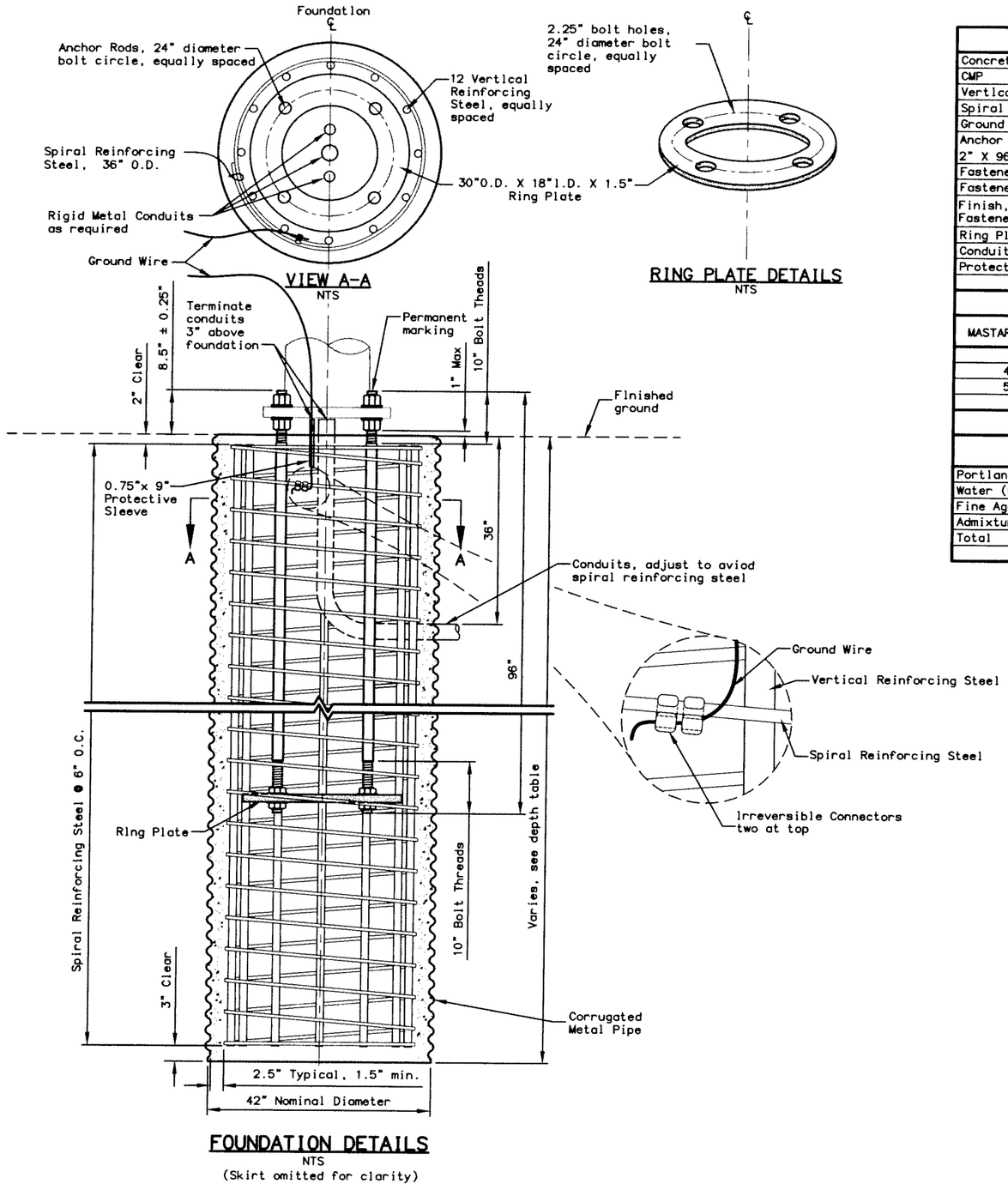
Sheet 2 of 2

State of Alaska
Department of Transportation
& Public Facilities

TRAFFIC SIGNAL HARDWARE

APPROVED
Date 5/31/12

T-30.11 Sheet 2



FOUNDATION DETAILS
NTS
(Skirt omitted for clarity)

MATERIAL REQUIREMENTS		
Concrete	Class A	f'c = 4000 psi
CMP	AASHTO M218	14 ga.
Vertical Reinforcing Steel	AASHTO M31 #11	GR 60
Spiral Reinforcing Steel	AASHTO M31 #5	GR 60
Ground Wire		#4 awg
Anchor Rods 2" X 96"	ASTM F1554 S2, S3, & S5	GR 105
Fasteners, Washers	AASHTO M293	
Fasteners, Nuts	AASHTO M292	
Finish, Anchor Rods & Fasteners	AASHTO M232	
Ring Plate	AASHTO M270	GR 36
Conduit	Sch 40	RMC
Protective Sleeve	Sch 40	PVC

DEPTH TABLE		
MASTARM(S) LENGTH (ft.)	FOUNDATION DEPTH BY APPLICATION (ft.)	
	SINGLE MASTARM	DOUBLE MASTARM
L <= 40	10	13
45 <= L <= 50	11	14
55 <= L <= 65	12	15

SAND SLURRY MIX DESIGN		
ITEM	BATCHING QUANTITIES PER CYD BATCH (lbs.)	APPLICABLE SPECS.
Portland Cement Concrete	188	701-2.01
Water (52.1 gal.)	435	712-2.01
Fine Aggregate SSD	3041	703-2.01
Admixture: Microair	2.0 oz.	711-2.02
Total	3664	

T-52.20

DESIGN NOTES:

Design Standard: 2001 Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals with 2006 Interim.

Design Load: 6,500 lbs axial, 6,500 lbs shear, 175,000 ft-lbs moment.

Construction Standards: Latest edition of the State Of Alaska Standard Specifications for Highway Construction with Special Provisions.

NOTES:

1. This foundation is approved for traffic signal applications in cohesionless soils with an N1-60 value of 10 or greater per AASHTO T-206, "Standard Penetration Test" (SPT). This foundation shall not be used if any of the following are encountered; water table above the bottom of foundation, very loose soils, organic soils or, cohesive soils (clay), or soils susceptible to frost jacking. If any of these conditions are encountered, stop foundation work and contact the Engineer.
2. Place foundation in drilled or excavated hole with centerline of foundation located at the station, offset, and elevation specified in plans. Set foundation flush with surrounding surface. Grade to drain away from foundation without exposing more than 4" of the foundation from the surrounding ground surface.
3. Form the foundation in corrugated metal pipe conforming to Subsection 707-2.01 of the Specifications.
4. Provide 1.5 extra turns at each end of the spiral reinforcing steel. Reinforcing steel shall not be spliced. Tie vertical reinforcing steel to each intersection of the spiral reinforcing steel.
5. Connect ground wire near the top spiral reinforcing steel with two irreversible connectors as shown. Fasten connectors according to the manufacturers' recommendations including the use of manufacturer specified tools. The ground wire may be bare solid, stranded, or braided copper. Protect ground wire with protective sleeve as shown and fill with silicon sealant.
6. The Ring Plate May be "built up" of multiple steel plates. The minimum thickness for any one plate is 0.5 inches. Fasten the ring plate to anchor rods with nuts and washers on both sides of ring plate as shown. Torque ring plate nuts to 600 ft-lbs.
7. Anchor rods are subject to Charpy V-Notch Impact Testing. Submit mill certifications for anchor rods, nuts and washers. Galvanize anchor rods full length. Provide permanent manufacturer's identification and permanent grade identification on each end of anchor rod by steel die stamp. Secure exposed anchor rods with a "ring plate" when not in service. Install anchor rods plumb. Anchor rods greater than 1:40 out-of-plumb will result in foundation rejection.
8. Complete all concrete work in conformance with Sections 501, 503, and 660 of the Specifications. Use a tube with a hopper head or other approved device when dropping concrete more than 5 feet per Subsection 501-3.08. Vibrate concrete during placement by mechanical vibration per Subsection 501-3.08. Ensure upper anchor rod threads are protected from contact with concrete during pour.
9. Backfill and compact according to Section 205, and Subsections 203-3.04 and 660-3.01 of the Specifications. Use select material, Type A or sand slurry as backfill material. Ensure area below foundation meets compaction requirements and is free of loose material and debris prior to concrete work.

REVISIONS		
Date	Description	By
05/31/12	Complete Modification	CMW

SHEET 1 OF 1

State of Alaska
Department of Transportation
& Public Facilities

CONCRETE 42" DIA. SIGNAL POLE FOUNDATION

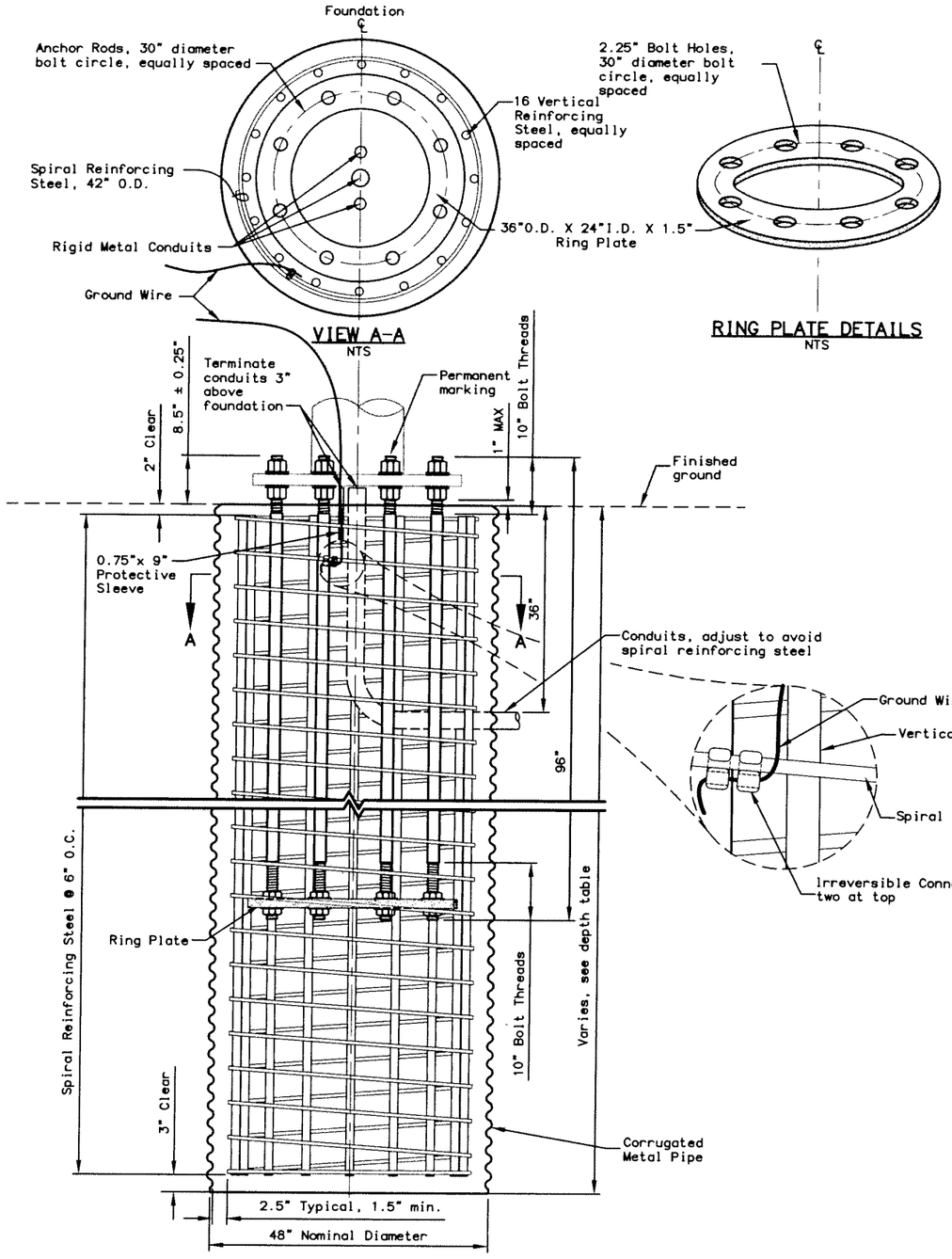
APPROVED

STATE OF ALASKA 49TH
Charles M. Wagner
CE 11155
REGISTERED PROFESSIONAL ENGINEER

Date 05/31/12

T-52.20

T-53.00



FOUNDATION DETAILS
NTS
(Skirt omitted for clarity)

MATERIAL REQUIREMENTS		
Concrete	Class A	f'c = 4000 psi
CMP	AASHTO M218	14 ga.
Vertical Reinforcing Steel	AASHTO M31 #11	GR 60
Spiral Reinforcing Steel	AASHTO M31 #5	GR 60
Ground Wire		#4 awg
Anchor Rods 2" X 96"	ASTM F1554 S2, S3, & S5	GR 105
Fasteners, Washers	AASHTO M293	
Fasteners, Nuts	AASHTO M292	
Finish, Anchor Rods & Fasteners	AASHTO M232	
Ring Plate	AASHTO M270	GR 36
Conduit	Sch 40	RMC
Protective Sleeve	Sch 40	PVC

DEPTH TABLE		
MASTARM(S) LENGTH (ft.)	FOUNDATION DEPTH BY APPLICATION (ft.)	
	SINGLE MASTARM	DOUBLE MASTARM
70 <= L <= 75	12	15

SAND SLURRY MIX DESIGN		
ITEM	BATCHING QUANTITIES PER CYD BATCH (lbs.)	APPLICABLE SPECS.
Portland Cement Concrete	188	701-2.01
Water (52.1 gal.)	435	712-2.01
Fine Aggregate SSD	3041	703-2.01
Admixture: Microair	2.0 oz.	711-2.02
Total	3664	

DESIGN NOTES:

Design: 2001 Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals with 2006 Interim.

Design Load: 7,500 lbs axial, 7,500 lbs shear, 200,000 ft-lbs moment.

Construction Standard: Latest edition of the State Of Alaska Standard Specifications for Highway Construction with Special Provisions.

NOTES:

1. This foundation is approved for traffic signal applications in cohesionless soils with an N1-60 value of 10 or greater per AASHTO T-206, "Standard Penetration Test" (SPT). This foundation shall not be used if any of the following are encountered; water table above the bottom of foundation, very loose soils, organic soils, cohesive soils (clay), or soils susceptible to frost jacking. If any of these conditions are encountered, stop foundation work and contact the Engineer.
2. Place foundation in drilled or excavated hole with centerline of foundation located at the station, offset, and elevation specified in plans. Set foundations flush with surrounding surface. Grade to drain away from foundation without exposing more than 4" of the foundation from the surrounding ground surface.
3. Form the foundation in corrugated metal pipe conforming to Subsection 707-2.01 of the Specifications.
4. Provide 1.5 extra turns at each end of the spiral reinforcing steel. Reinforcing steel shall not be spliced. Tie vertical reinforcing steel to each intersection of the spiral reinforcing steel.
5. Connect ground wire near the top of spiral reinforcing steel with two irreversible connectors as shown. Fasten connectors according to the manufacturers' recommendations including the use of manufacturer specified tools. The ground wire may be bare solid, stranded, or braided copper. Protect ground wire with protective sleeve as shown and fill with silicon sealant.
6. The ring plate may be "built up" of multiple steel plates. The minimum thickness for any one plate is 0.5 inches. Fasten the ring plate to anchor rods with nuts and washers on both sides of ring plate as shown. Torque ring plate nuts to 600 ft-lbs.
7. Anchor rods are subject to Charpy V-Notch Impact Testing. Submit mill certifications for anchor rods, nuts and washers. Galvanize anchor rods full length. Provide permanent manufacturer's identification and permanent grade identification on each end of anchor rod by steel die stamp. Secure exposed anchor rods with a "ring plate" when not in service. Install anchor rods plumb. Anchor rods greater than 1:40 out-of-plumb will result in foundation rejection.
8. Complete all concrete work in conformance with Sections 501, 503, and 660 of the Specifications. Use a tube with a hopper head or other approved device when dropping concrete more than 5 feet per Subsection 501-3.08. Vibrate concrete during placement by mechanical vibration per Subsection 501-3.08. Ensure upper anchor rod threads are protected from contact with concrete during pour.
9. Backfill and compact according to Section 205, and Subsections 203-3.04 and 660-3.01 of the Specifications. Use select material, Type A or sand slurry as backfill material. Ensure area below foundation meets compaction requirements and is free of loose material and debris prior to concrete work.

REVISIONS		
Date	Description	By

SHEET 1 OF 1

State of Alaska
Department of Transportation
& Public Facilities

CONCRETE 48" DIA. SIGNAL POLE FOUNDATION

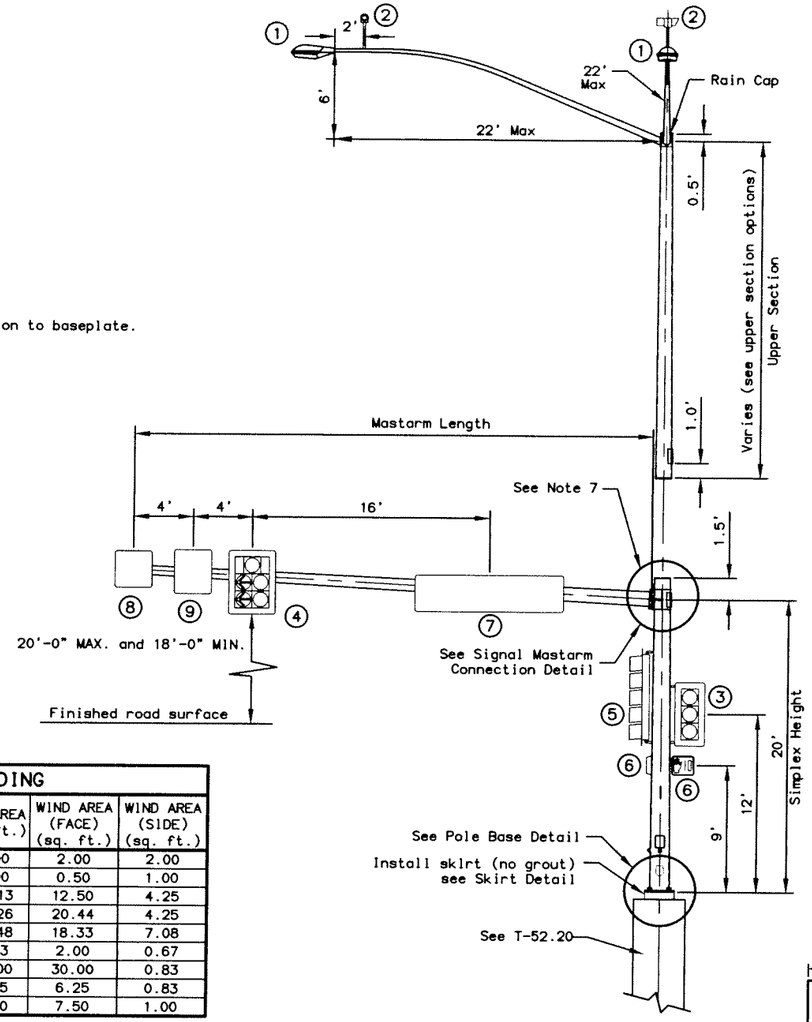
APPROVED
STATE OF ALASKA 49TH
Charles M. Wagner CE 11155
REGISTERED PROFESSIONAL ENGINEER
Date 05/31/12

T-53.00

T-54.00

MASTARM DATA			
MASTARM			
Length (ft.)	Allowed Deflection DueTo Galloping (ft.)	Fixed End O.D. (in.)*	Thick (in.)
15	0.670	9.35	0.239
20	0.670	10.05	0.239
25	0.670	10.75	0.239
30	0.670	11.45	0.239
35	0.670	12.15	0.239

*Fixed end diameter measured at connection to baseplate.



ELEVATION VIEW
NTS

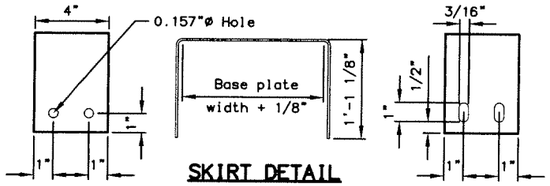
POLE DESIGN LOADING					
LOAD COMPONENT	HEIGHT (ft.)	WEIGHT (lbs.)	ICE AREA (sq ft.)	WIND AREA (FACE) (sq. ft.)	WIND AREA (SIDE) (sq. ft.)
1 = Luminaire	0.67	50	6.00	2.00	2.00
2 = Camera	0.50	20	2.00	0.50	1.00
3 = Signal	5.00	60	29.13	12.50	4.25
4 = Signal	5.33	100	46.26	20.44	4.25
5 = Signal	7.33	100	45.48	18.33	7.08
6 = Ped Head	1.33	25	6.83	2.00	0.67
7 = Sign	2.50	120	30.00	30.00	0.83
8 = Sign	2.50	25	6.25	6.25	0.83
9 = Sign	3.00	30	7.50	7.50	1.00

MATERIAL REQUIREMENTS	
ALL ASSEMBLIES	
Steel Through 1/2" Thick	ASTM A572 or A595
Steel Over 1/2" Thick	AASHTO M270 F3 (50ksi)
Finish	AASHTO M111 & M232
Mastarm Bolts	AASHTO M164
Anchor Rods	See T-52.20
POLE (LOWER SECTION)	
Design Length	21.5'
Section Shape	Round
Simplex Height	20'
Fixed End Diameter	15.0" O.D.
Taper	0.14"/ft
Tube Thickness	0.375"
Base Plate	24" X 24" X 2.25"
Bolt Circle	24"
Signal Arm Plate	20" X 20" X 2.25"
Top Ring Thickness	0.375"
Bottom Ring Thickness	0.375"
Gusset Plate Thickness	0.375"
Handhole Cover Thickness	10 ga
Pole Skirt Thickness	10 ga
MASTARM	
Design Length	35'
Section Shape	Round
Taper	0.14"/ft
Tube Thickness	Mastarm Data
Mastarm Rise	3.0 Degrees
Base Plate	20" X 20" X 2.25"
Bolt Circle	20"
Mastarm Bolts	1.5" X 4.5"

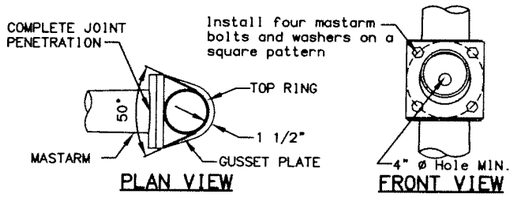
NOTES:

1. Provide pole assemblies meeting the following design criteria; 2001 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, the latest edition of the Alaska Standard Specifications for Highway Construction including Standard Modifications and, Special Provisions. Design for a basic wind speed of 100 mph, Fatigue Category III, with galloping. Measure allowed deflection due to galloping at the free end of mastarm.
2. Provide poles to accommodate the maximum length shown in the Mastarm Data with the given loads, dimensions and material requirements.
3. This drawing shows loads (signs and signals) to be used by manufacturers when designing poles. It does not show actual loading of poles/mastarms on individual projects. This pole/mastarm design may be used without further analysis if the following conditions are met:
   - The guide sign (load #7) is attached to the mastarm base section and,
   - Not more than 4 traffic signals and/or signs are attached to the mastarm.

   If these conditions are not met, this standard pole/mastarm design may only be used if design computations are submitted that demonstrate conformance to design criteria (Note 1) using actual loads. Note: Devices with less than 1 square foot of projected area may be added to the mastarm without causing a need for additional design computations.
4. The manufacturer is to determine weld sizes. All welds and testing shall conform to the latest edition of the Structural Welding Code AWS D1.1. Provide visual test (VT) of 100% of all welds. Provide magnetic particle test (MT) of 100% of all fillet welds. Provide Radiographic (RT) or ultrasonic test (UT) of 100% of all complete joint penetration welds and a random 25% of all partial joint penetration longitudinal seam welds.
5. Fabricate pole tubes from no more than 2 pieces of steel. When using 2 pieces, place the longitudinal welded seams directly opposite one another.
6. Fabricate luminaire arms and connections according to Standard Drawing L-03.10.
7. Provide permanent tags on all pole sections per Section 740 Table 740-1 of the Specifications. Provide a rain cap when no upper section is specified.
8. The Department will reject damaged or defective poles for any of the following; variances from approved shop drawings, variances from material requirements, sections more than 2-percent out of round, sections bowed more than 1-inch throughout the length of the pole, mastarm, or segment and, damaged or dented finishes.
9. Drill a 1" maximum diameter hole at each traffic signal location. Orient the hole on the horizontal axis of mastarms.
10. Install pole plumb by ensuring the side opposite the mastarm is vertical in its final deflected position.
11. Clean and remove dirt, burrs, mill scale, and excess galvanization on all faying surfaces and threaded parts before assembly. Lubricate the threads of all bolts and nuts with lubricant containing a visible dye. Tighten all bolts according to section 504 of the specifications.

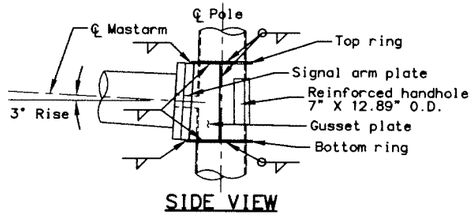


SKIRT DETAIL
NTS
(Two required per pole)



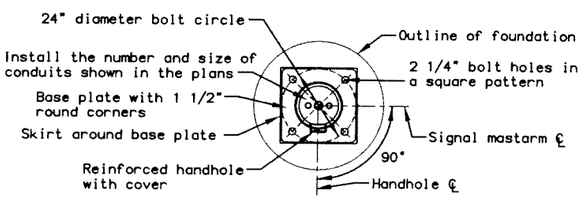
PLAN VIEW

FRONT VIEW

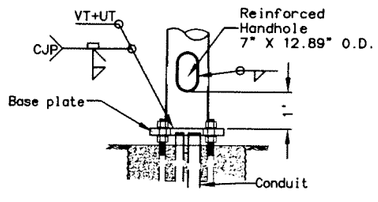


SIDE VIEW

SIGNAL MASTARM CONNECTION DETAIL
NTS
(Elevation view of a ring stiffened built-up box)



PLAN VIEW
(Shown without anchor bolts and nuts for clarity)



FRONT VIEW
(Skirt omitted for clarity)

POLE BASE DETAIL
NTS

REVISIONS		
Date	Description	By

SHEET 1 OF 2

State of Alaska
Department of Transportation & Public Facilities

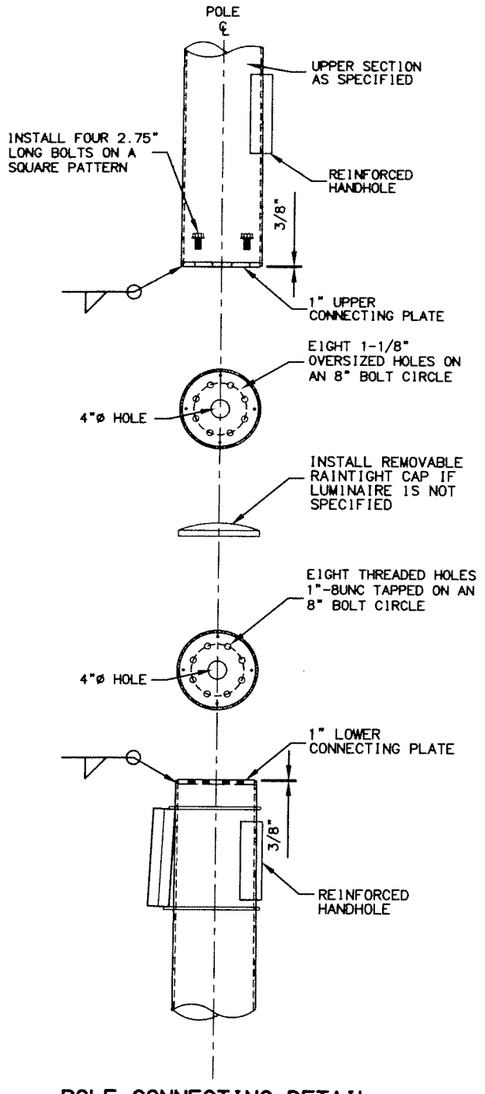
SIGNAL POLE
WITH 15' TO 35' MASTARM,
LOWER SECTION

APPROVED
STATE OF ALASKA 49TH
Charles M. Wagner CE 11155 REGISTERED PROFESSIONAL ENGINEER

Date 05/31/12

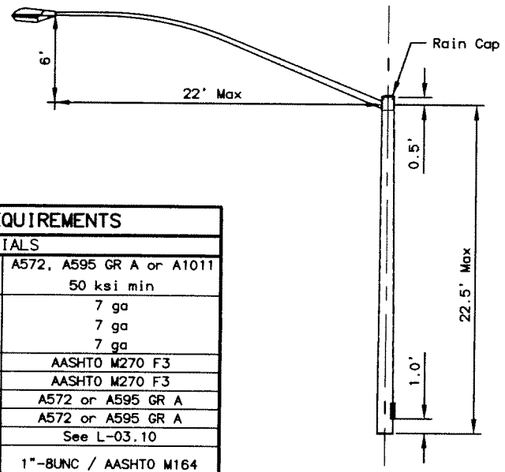
T-54.00 Sheet 1 of 2

T-54.00

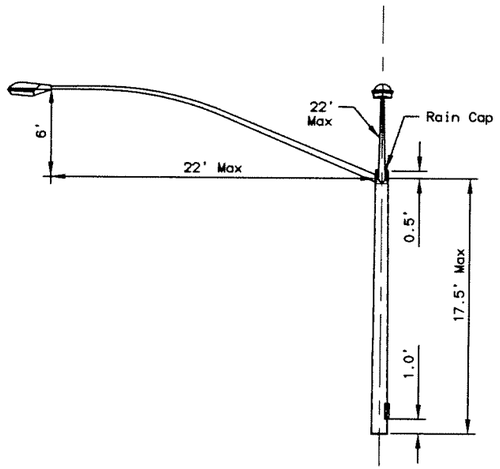


POLE CONNECTING DETAIL

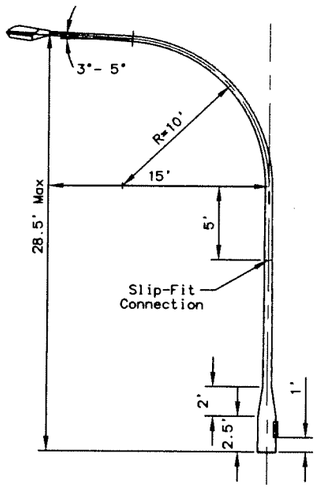
MATERIAL REQUIREMENTS	
MATERIALS	
Tube Material	A572, A595 GR A or A1011 50 ksi min
Single Luminaire Tube	7 ga
Double Luminaire Tube	7 ga
Davit Luminaire Tube	7 ga
Lower Connecting Plate	AASHTO M270 F3
Upper Connecting Plate	AASHTO M270 F3
Concentric Reducer	A572 or A595 GR A
Connection Tube	A572 or A595 GR A
Luminaire Arm Materials	See L-03.10
Upper Section Attachment Bolts	1"-8UNC / AASHTO M164
Luminaire Attachment Bolts	3/4"-10 / AASHTO M164
Slip-fit Through Bolt	5/8" / AASHTO M164
Finish	AASHTO M111 & M232
Handhole	7" X 12.89" O.D.
SINGLE LUMINAIRE	
Design Length	22.5'
Section Shape	Round
Fixed End Diameter	11.99" O.D.
Taper	0.14"/ft
Luminaire Arm Details	See L-03.10
DOUBLE LUMINAIRE	
Design Length	17.5'
Section Shape	Round
Fixed End Diameter	11.99" O.D.
Taper	0.14"/ft
Luminaire Arm Details	See L-03.10
DAVIT LUMINAIRE ARM	
Design Height	28.5'
Design Offset	15'
Radius	10'
Section Shape	Round
Fixed End Diameter	11.99" O.D.
Free End Diameter	2.375" O.D.
Taper	0.14"/ft
Concentric Reducer	7 ga
Connection Tube	7 ga



SINGLE LUMINAIRE



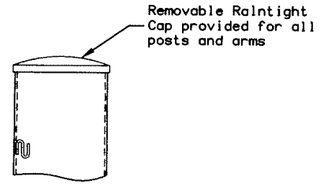
DOUBLE LUMINAIRE



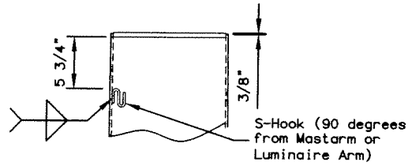
DAVIT LUMINAIRE

UPPER SECTION OPTIONS

NTS



RAIN CAP DETAIL



LOWER SECTION POST TOP

NTS

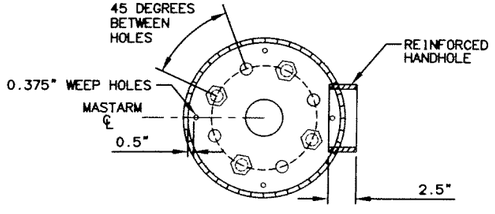
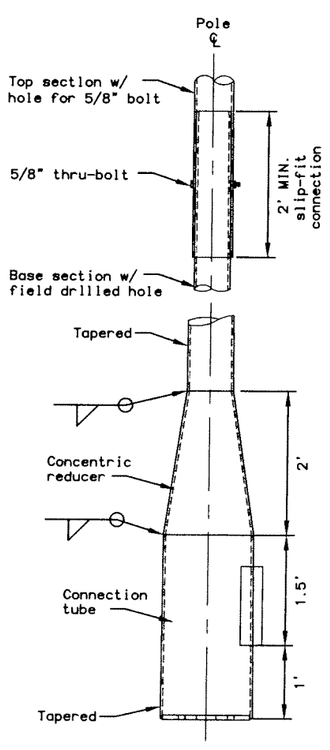


PLATE DETAILS



DAVIT CONNECTION DETAIL

NTS

REVISIONS		
Date	Description	By

SHEET 2 OF 2

State of Alaska
Department of Transportation
& Public Facilities

SIGNAL POLE
WITH 15' TO 35' MASTARM,
UPPER SECTION

APPROVED
STATE OF ALASKA 49TH
Charles M. Wagner
CE 11155
REGISTERED PROFESSIONAL ENGINEER

Date 05/31/12

Sheet 2 of 2

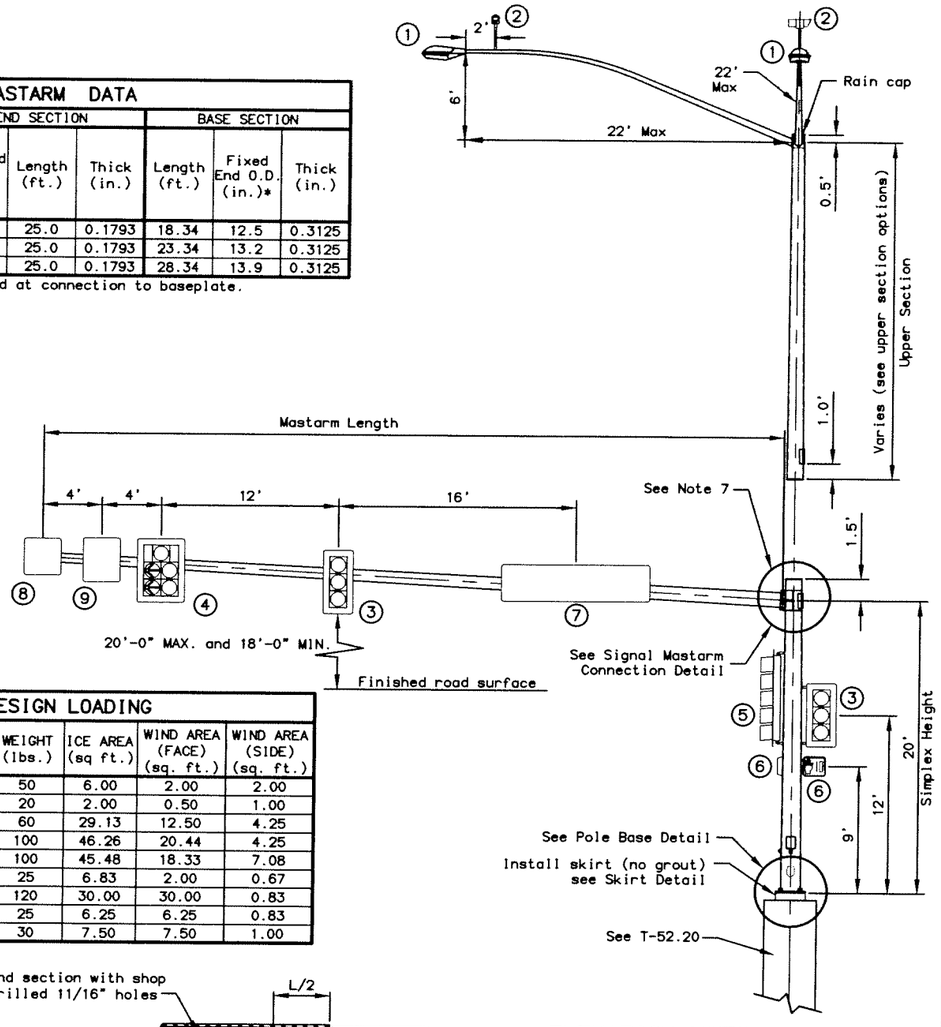
T-54.00

T-55.00

MASTARM DATA

MASTARM		END SECTION			BASE SECTION		
Length (ft.)	Allowed Deflection Due To Galloping (in.)	Free End O.D. (in.)	Length (ft.)	Thick (in.)	Length (ft.)	Fixed End O.D. (in.)*	Thick (in.)
40	8.0	7.3	25.0	0.1793	18.34	12.5	0.3125
45	8.0	7.3	25.0	0.1793	23.34	13.2	0.3125
50	8.0	7.3	25.0	0.1793	28.34	13.9	0.3125

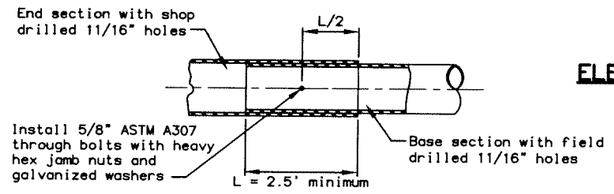
*Fixed end diameter measured at connection to baseplate.



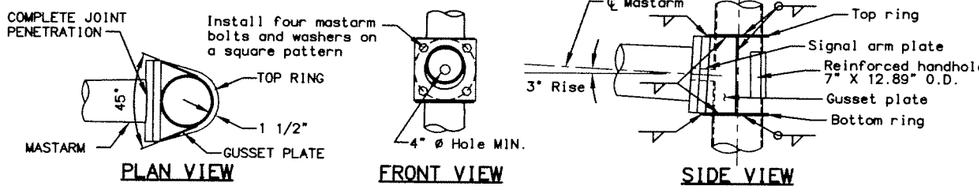
ELEVATION VIEW
NTS

POLE DESIGN LOADING

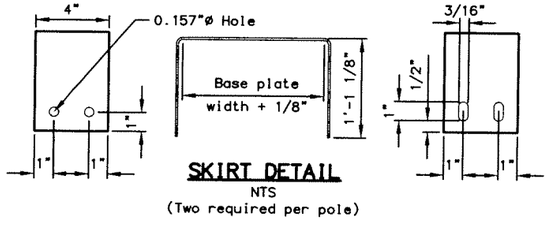
LOAD COMPONENT	HEIGHT (ft.)	WEIGHT (lbs.)	ICE AREA (sq ft.)	WIND AREA (FACE) (sq. ft.)	WIND AREA (SIDE) (sq. ft.)
1 = Luminaire	0.67	50	6.00	2.00	2.00
2 = Camera	0.50	20	2.00	0.50	1.00
3 = Signal	5.00	60	29.13	12.50	4.25
4 = Signal	5.33	100	46.26	20.44	4.25
5 = Signal	7.33	100	45.48	18.33	7.08
6 = Ped Head	1.33	25	6.83	2.00	0.67
7 = Sign	2.50	120	30.00	30.00	0.83
8 = Sign	2.50	25	6.25	6.25	0.83
9 = Sign	3.00	30	7.50	7.50	1.00



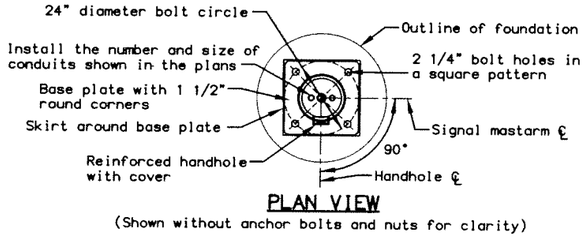
MASTARM SLIP SPLICE ELEVATION DETAIL
NTS



SIGNAL MASTARM CONNECTION DETAIL
NTS
(Elevation view of a ring stiffened built-up box)



SKIRT DETAIL
NTS
(Two required per pole)



(Shown without anchor bolts and nuts for clarity)

(Skirt omitted for clarity)

POLE BASE DETAIL
NTS

MATERIAL REQUIREMENTS

ALL ASSEMBLIES	
Steel Through 1/2" Thick	ASTM A572 or A595
Steel Over 1/2" Thick	AASHTO M270 F3 (50ksi)
Finish	AASHTO M111 & M232
Mastarm Bolts	AASHTO M164
Anchor Rods	See T-52.20

POLE (LOWER SECTION)	
Design Length	21.5'
Section Shape	Round
Simplex Height	20'
Fixed End Diameter	17" O.D.
Taper	0.14"/ft
Tube Thickness	0.375"
Base Plate	24" X 24" X 2.25"
Bolt Circle	24"
Signal Arm Plate	22" X 22" X 2.25"
Top Ring Thickness	0.375"
Bottom Ring Thickness	0.375"
Gusset Plate Thickness	0.375"
Handhole Cover Thickness	10 ga
Pole Skirt Thickness	10 ga

MASTARM	
Design Length	50'
Section Shape	Round
Taper	0.14"/ft
Tube Thickness	Mastarm Data
Mastarm Rise	3.0 Degrees
Base Plate	22" X 22" X 2.25"
Bolt Circle	22"
Mastarm Bolts	1.5" X 4.5"

NOTES:

1. Provide pole assemblies meeting the following design criteria; 2001 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, the latest edition of the Alaska Standard Specifications for Highway Construction including Standard Modifications and, Special Provisions. Design for a basic wind speed of 100 mph, Fatigue Category III, with galloping. Measure allowed deflection due to galloping at the free end of mastarm.
2. Provide poles to accommodate the maximum length shown in the Mastarm Data with the given loads, dimensions and material requirements.
3. This drawing shows loads (signs and signals) to be used by manufacturers when designing poles. It does not show actual loading of poles/mastarms on individual projects. This pole/mastarm design may be used without further analysis if the following conditions are met:
   - The guide sign (load #7) is attached to the mastarm base section and,
   - Not more than 4 traffic signals and/or signs are attached to the end section of the mastarm.

   If these conditions are not met, this standard pole/mastarm design may only be used if design computations are submitted that demonstrate conformance to design criteria (Note 1) using actual loads. Note: Devices with less than 1 square foot of projected area may be added to the mastarm without causing a need for additional design computations.
4. The manufacturer is to determine weld sizes. All welds and testing shall conform to the latest edition of the Structural Welding Code AWS D1.1. Provide visual test (VT) of 100% of all welds. Provide magnetic particle test (MT) of 100% of all fillet welds. Provide Radiographic (RT) or ultrasonic test (UT) of 100% of all complete joint penetration welds and a random 25% of all partial joint penetration longitudinal seam welds.
5. Fabricate pole tubes from no more than 2 pieces of steel. When using 2 pieces, place the longitudinal welded seams directly opposite one another.
6. Fabricate luminaire arms and connections according to Standard Drawing L-03.10.
7. Provide permanent tags on all pole sections per Section 740 Table 740-1 of the Specifications. Provide a rain cap when no upper section is specified.
8. The Department will reject damaged or defective poles for any of the following; variances from approved shop drawings, variances from material requirements, sections more than 2-percent out of round, sections bowed more than 1-inch throughout the length of the pole, mastarm, or segment and, damaged or dented finishes.
9. Drill a 1" maximum diameter hole at each traffic signal location. Orient the hole on the horizontal axis of mastarms.
10. Install pole plumb by ensuring the side opposite the mastarm is vertical in its final deflected position.
11. Align welded seams on adjacent sections of mastarms to form continuous straight seams the length of the mastarm. Mechanically force mastarm sections together for a snug fit.
12. Clean and remove dirt, burrs, mill scale, and excess galvanization on all faying surfaces and threaded parts before assembly. Lubricate the threads of all bolts and nuts with lubricant containing a visible dye. Tighten all bolts according to section 504 of the specifications.

REVISIONS		
Date	Description	By

SHEET 1 OF 2

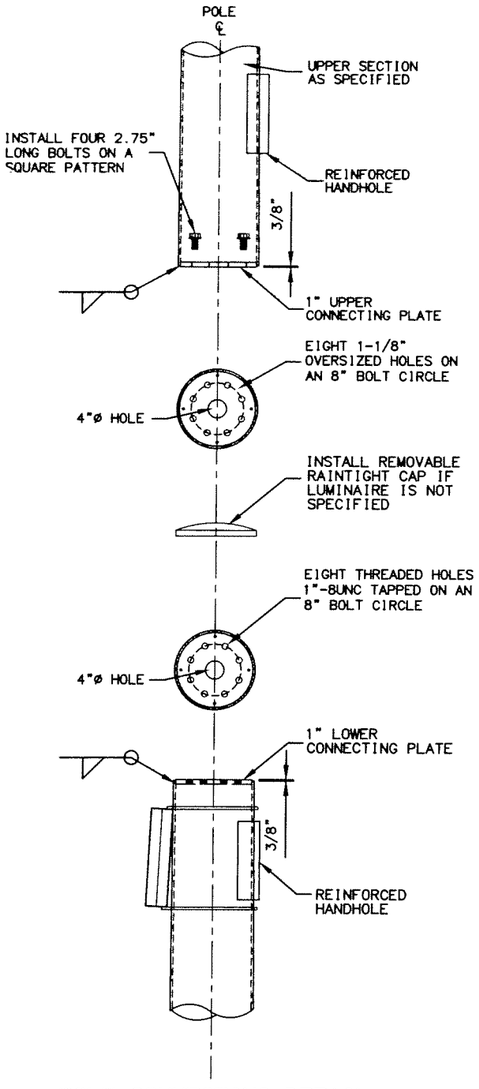
State of Alaska
Department of Transportation & Public Facilities

SIGNAL POLE WITH 40' TO 50' MASTARM, LOWER SECTION

APPROVED
STATE OF ALASKA 49TH
Charles M. Wagner CE 11155
REGISTERED PROFESSIONAL ENGINEER

Date 05/31/12

T-55.00



POLE CONNECTING DETAIL

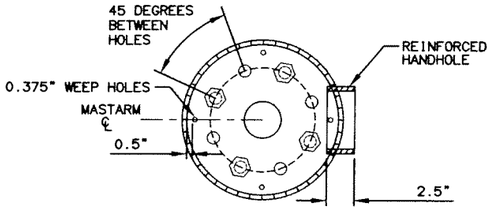
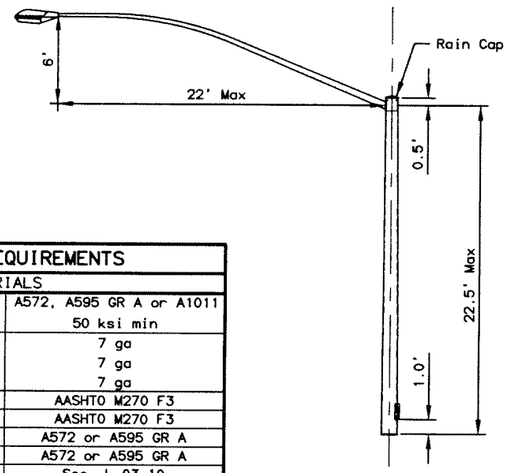
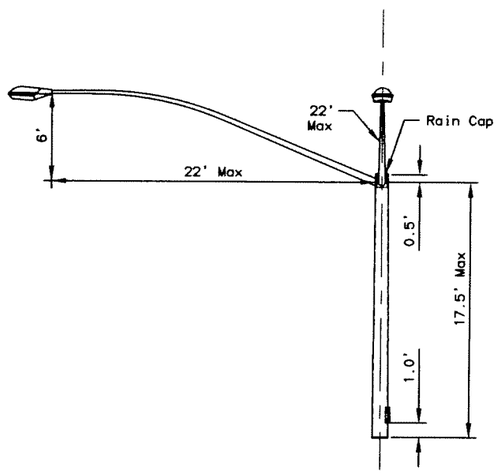


PLATE DETAILS

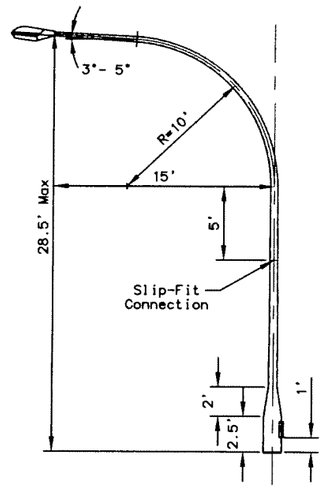
MATERIAL REQUIREMENTS	
MATERIALS	
Tube Material	A572, A595 GR A or A1011 50 ksi min
Single Luminaire Tube	7 ga
Double Luminaire Tube	7 ga
Davit Luminaire Tube	7 ga
Lower Connecting Plate	AASHTO M270 F3
Upper Connecting Plate	AASHTO M270 F3
Concentric Reducer	A572 or A595 GR A
Connection Tube	A572 or A595 GR A
Luminaire Arm Materials	See L-03.10
Upper Section Attachment Bolts	1"-8UNC / AASHTO M164
Luminaire Attachment Bolts	3/4"-10 / AASHTO M164
Slip-fit Through Bolt	5/8" / AASHTO M164
Finish	AASHTO M111 & M232
Handhole	7" X 12.89" O.D.
SINGLE LUMINAIRE	
Design Length	22.5'
Section Shape	Round
Fixed End Diameter	13.99" O.D.
Taper	0.14"/ft
Luminaire Arm Details	See L-03.10
DOUBLE LUMINAIRE	
Design Length	17.5'
Section Shape	Round
Fixed End Diameter	13.99" O.D.
Taper	0.14"/ft
Luminaire Arm Details	See L-03.10
DAVIT LUMINAIRE ARM	
Design Height	28.5'
Design Offset	15'
Radius	10'
Section Shape	Round
Fixed End Diameter	13.99" O.D.
Free End Diameter	2.375" O.D.
Taper	0.14"/ft
Concentric Reducer	7 ga
Connection Tube	7 ga



SINGLE LUMINAIRE



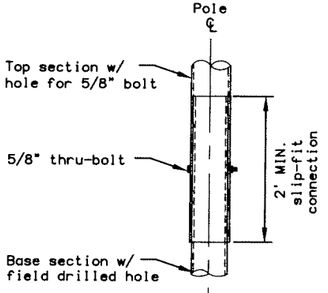
DOUBLE LUMINAIRE

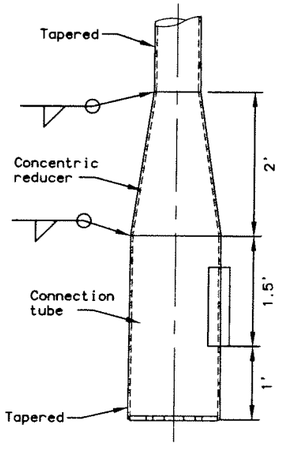


DAVIT LUMINAIRE

UPPER SECTION OPTIONS

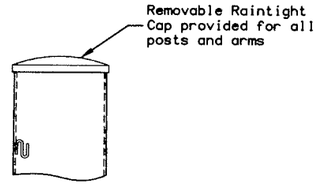
NTS



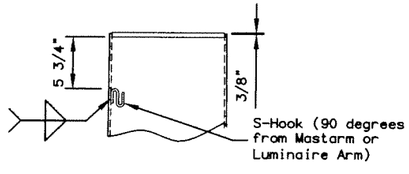


DAVIT CONNECTION DETAIL

NTS



RAIN CAP DETAIL



LOWER SECTION POST TOP

NTS

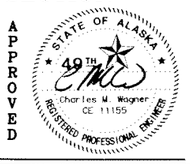
REVISIONS		
Date	Description	By

SHEET 2 OF 2

State of Alaska
Department of Transportation
& Public Facilities

SIGNAL POLE
WITH 40' TO 50' MASTARM,
UPPER SECTION

APPROVED



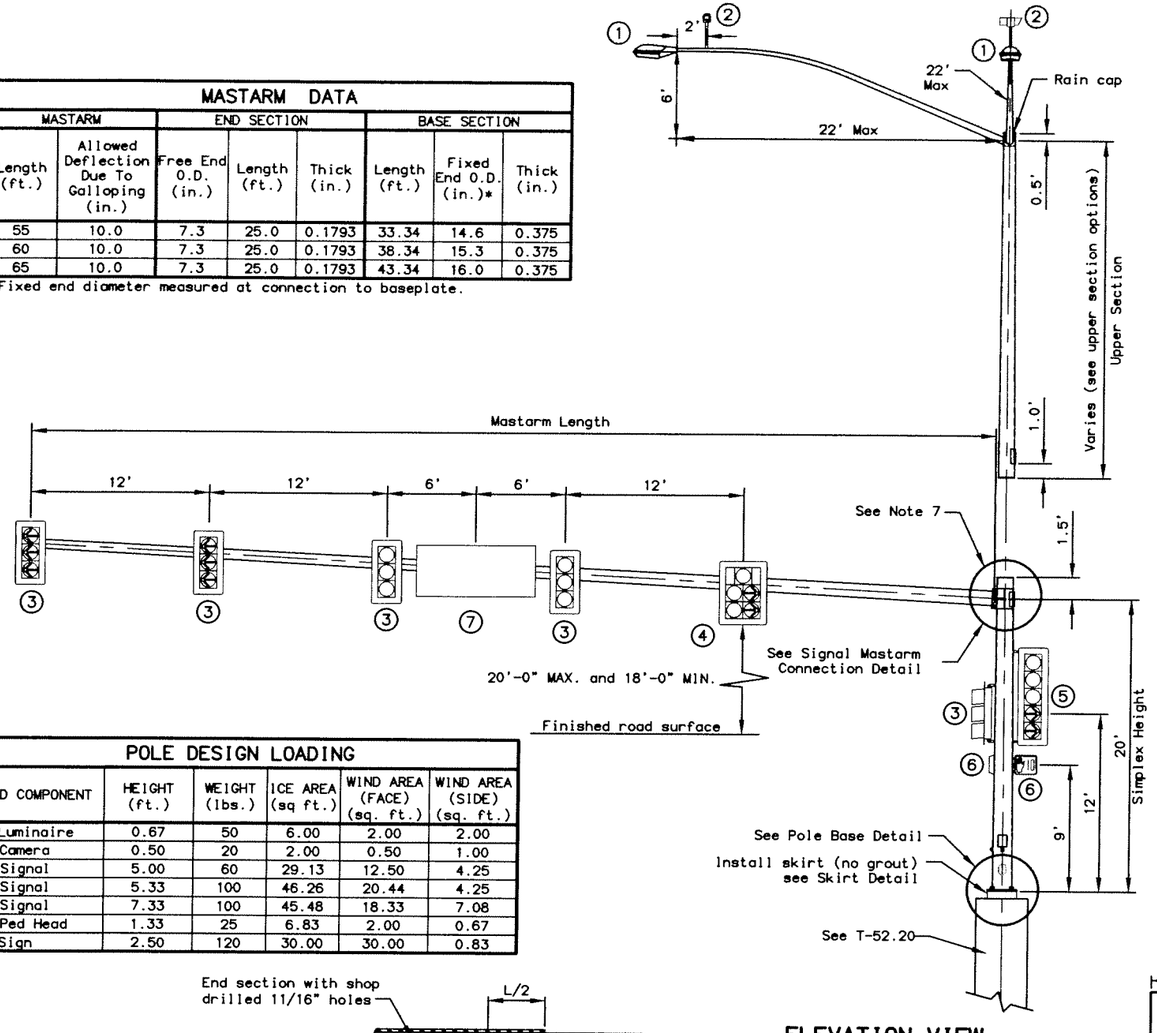
Date 05/31/12

T-56.00

MASTARM DATA

MASTARM		END SECTION			BASE SECTION		
Length (ft.)	Allowed Deflection Due To Galloping (in.)	Free End O.D. (in.)	Length (ft.)	Thick (in.)	Length (ft.)	Fixed End O.D. (in.)*	Thick (in.)
55	10.0	7.3	25.0	0.1793	33.34	14.6	0.375
60	10.0	7.3	25.0	0.1793	38.34	15.3	0.375
65	10.0	7.3	25.0	0.1793	43.34	16.0	0.375

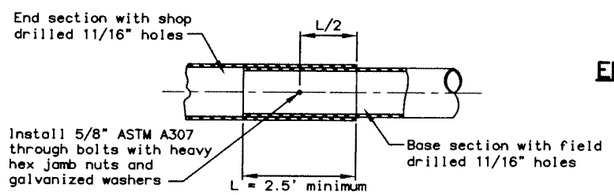
*Fixed end diameter measured at connection to baseplate.



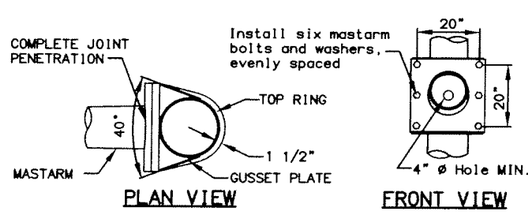
ELEVATION VIEW
NTS

POLE DESIGN LOADING

LOAD COMPONENT	HEIGHT (ft.)	WEIGHT (lbs.)	ICE AREA (sq ft.)	WIND AREA (FACE) (sq. ft.)	WIND AREA (SIDE) (sq. ft.)
1 = Luminaire	0.67	50	6.00	2.00	2.00
2 = Camera	0.50	20	2.00	0.50	1.00
3 = Signal	5.00	60	29.13	12.50	4.25
4 = Signal	5.33	100	46.26	20.44	4.25
5 = Signal	7.33	100	45.48	18.33	7.08
6 = Ped Head	1.33	25	6.83	2.00	0.67
7 = Sign	2.50	120	30.00	30.00	0.83

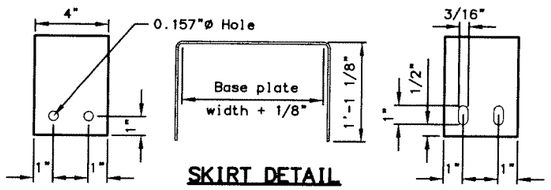


MASTARM SLIP SPLICE ELEVATION DETAIL
NTS

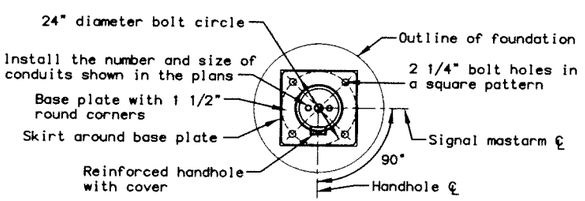


PLAN VIEW | FRONT VIEW | SIDE VIEW

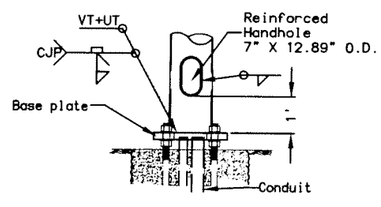
SIGNAL MASTARM CONNECTION DETAIL
NTS
(Elevation view of a ring stiffened built-up box)



SKIRT DETAIL
NTS
(Two required per pole)



PLAN VIEW
(Shown without anchor bolts and nuts for clarity)



FRONT VIEW
(Skirt omitted for clarity)

POLE BASE DETAIL
NTS

MATERIAL REQUIREMENTS

ALL ASSEMBLIES	
Steel Through 1/2" Thick	ASTM A572 or A595
Steel Over 1/2" Thick	AASHTO M270 F3 (50ksi)
Finish	AASHTO M111 & M232
Mastarm Bolts	AASHTO M164
Anchor Rods	See T-52.20

POLE (LOWER SECTION)	
Design Length	21.5'
Section Shape	Round
Simplex Height	20'
Fixed End Diameter	19.0" O.D.
Taper	0.14"/ft
Tube Thickness	0.375"
Base Plate	24" X 24" X 2.25"
Bolt Circle	24"
Signal Arm Plate	24" X 24" X 2.25"
Top Ring Thickness	0.375"
Bottom Ring Thickness	0.375"
Gusset Plate Thickness	0.375"
Handhole Cover Thickness	10 ga
Pole Skirt Thickness	10 ga

MASTARM	
Design Length	65'
Section Shape	Round
Taper	0.14"/ft
Tube Thickness	Mastarm Data
Mastarm Rise	3.0 Degrees
Base Plate	24" X 24" X 2.25"
Bolt Circle	6 Vertical O.C.
Mastarm Bolts	1.5" X 4.5"

NOTES:

1. Provide pole assemblies meeting the following design criteria; 2001 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, the latest edition of the Alaska Standard Specifications for Highway Construction including Standard Modifications and, Special Provisions. Design for a basic wind speed of 100 mph, Fatigue Category III, with galloping. Measure allowed deflection due to galloping at the free end of mastarm.
2. Provide poles to accommodate the maximum length shown in the Mastarm Data with the given loads, dimensions and material requirements.
3. This drawing shows loads (signs and signals) to be used by manufacturers when designing poles. It does not show actual loading of poles/mastarms on individual projects. This pole/mastarm design may be used without further analysis if the following conditions are met:
   - The guide sign (load #7) is attached to the mastarm base section and,
   - Not more than 4 traffic signals and/or signs are attached to the end section of the mastarm.

   If these conditions are not met, this standard pole/mastarm design may only be used if design computations are submitted that demonstrate conformance to design criteria (Note 1) using actual loads. Note: Devices with less than 1 square foot of projected area may be added to the mastarm without causing a need for additional design computations.
4. The manufacturer is to determine weld sizes. All welds and testing shall conform to the latest edition of the Structural Welding Code AWS D1.1. Provide visual test (VT) of 100% of all welds. Provide magnetic particle test (MT) of 100% of all fillet welds. Provide Radiographic (RT) or ultrasonic test (UT) of 100% of all complete joint penetration welds and a random 25% of all partial joint penetration longitudinal seam welds.
5. Fabricate pole tubes from no more than 2 pieces of steel. When using 2 pieces, place the longitudinal welded seams directly opposite one another.
6. Fabricate luminaire arms and connections according to Standard Drawing L-03.10.
7. Provide permanent tags on all pole sections per Section 740 Table 740-1 of the Specifications. Provide a rain cap when no upper section is specified.
8. The Department will reject damaged or defective poles for any of the following; variances from approved shop drawings, variances from material requirements, sections more than 2-percent out of round, sections bowed more than 1-inch throughout the length of the pole, mastarm, or segment and, damaged or dented finishes.
9. Drill a 1" maximum diameter hole at each traffic signal location. Orient the hole on the horizontal axis of mastarms.
10. Install pole plumb by ensuring the side opposite the mastarm is vertical in its final deflected position.
11. Align welded seams on adjacent sections of mastarms to form continuous straight seams the length of the mastarm. Mechanically force mastarm sections together for a snug fit.
12. Clean and remove dirt, burrs, mill scale, and excess galvanization on all faying surfaces and threaded parts before assembly. Lubricate the threads of all bolts and nuts with lubricant containing a visible dye. Tighten all bolts according to section 504 of the specifications.

REVISIONS		
Date	Description	By

SHEET 1 OF 2

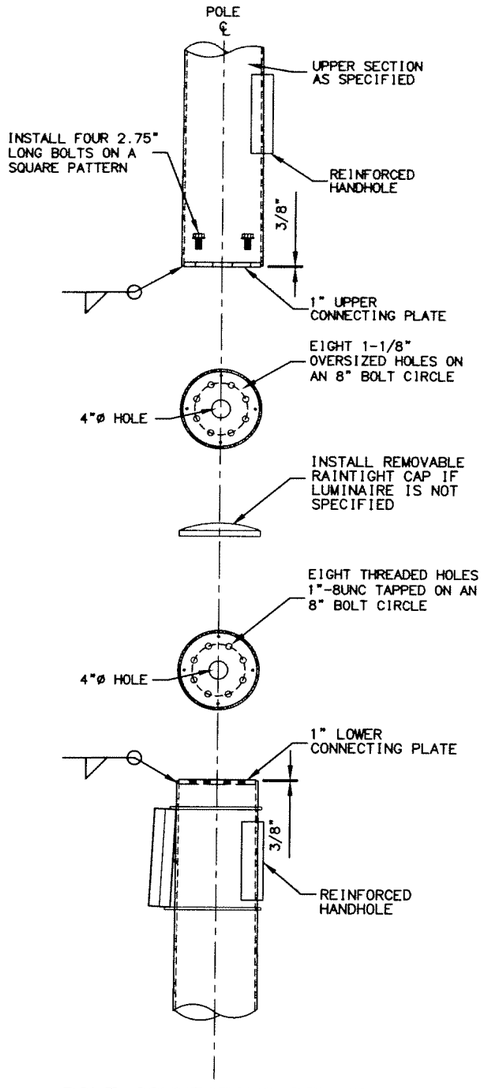
State of Alaska
Department of Transportation & Public Facilities

SIGNAL POLE
WITH 55' TO 65' MASTARM,
LOWER SECTION

APPROVED
STATE OF ALASKA 49TH
Charles M. Wagner CE 11155
REGISTERED PROFESSIONAL ENGINEER

Date 05/31/12

T-56.00



POLE CONNECTING DETAIL

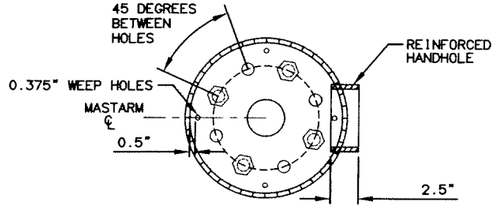
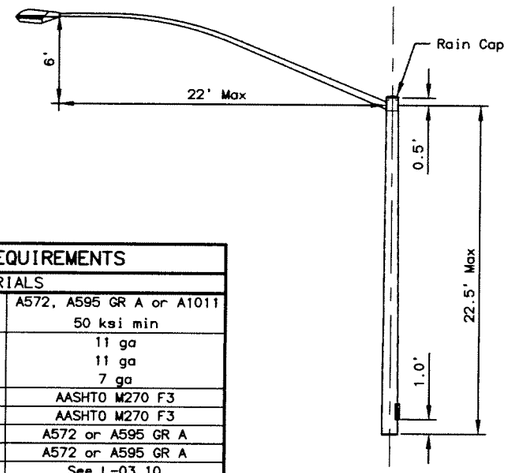
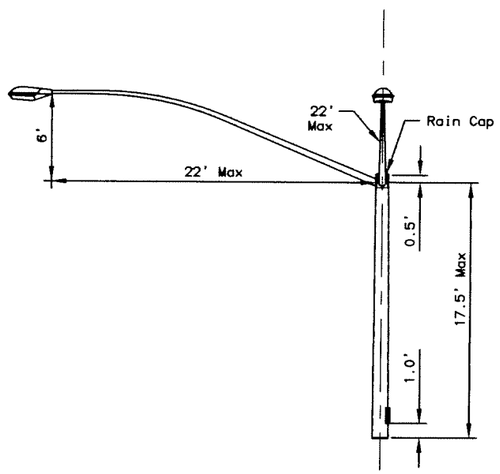


PLATE DETAILS

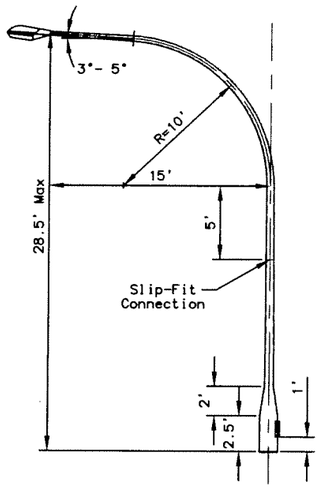
MATERIAL REQUIREMENTS	
MATERIALS	
Tube Material	A572, A595 GR A or A1011 50 ksi min
Single Luminaire Tube	11 ga
Double Luminaire Tube	11 ga
Davit Luminaire Tube	7 ga
Lower Connecting Plate	AASHTO M270 F3
Upper Connecting Plate	AASHTO M270 F3
Concentric Reducer	A572 or A595 GR A
Connection Tube	A572 or A595 GR A
Luminaire Arm Materials	See L-03.10
Upper Section Attachment Bolts	1"-8UNC / AASHTO M164
Luminaire Attachment Bolts	3/4"-10 / AASHTO M164
Slip-fit Through Bolt	5/8" / AASHTO M164
Finish	AASHTO M111 & M232
Handhole	7" X 12.89" O.D.
SINGLE LUMINAIRE	
Design Length	22.5'
Section Shape	Round
Fixed End Diameter	15.99" O.D.
Taper	0.14"/ft
Luminaire Arm Details	See L-03.10
DOUBLE LUMINAIRE	
Design Length	17.5'
Section Shape	Round
Fixed End Diameter	15.99" O.D.
Taper	0.14"/ft
Luminaire Arm Details	See L-03.10
DAVIT LUMINAIRE ARM	
Design Height	28.5'
Design Offset	15'
Radius	10'
Section Shape	Round
Fixed End Diameter	15.99" O.D.
Free End Diameter	2.375" O.D.
Taper	0.14"/ft
Concentric Reducer	7 ga
Connection Tube	7 ga



SINGLE LUMINAIRE



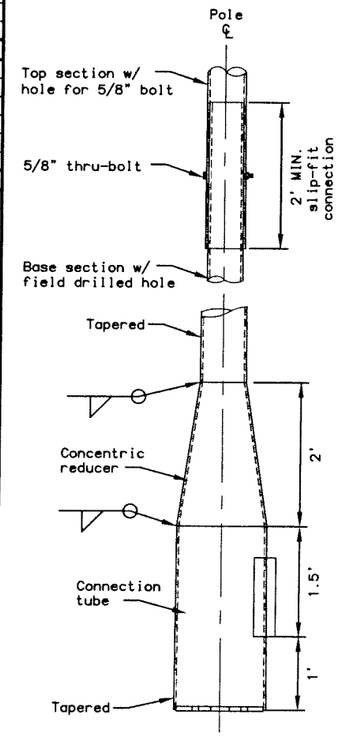
DOUBLE LUMINAIRE



DAVIT LUMINAIRE

UPPER SECTION OPTIONS

NTS



DAVIT CONNECTION DETAIL

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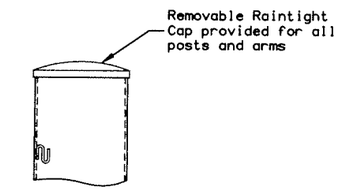
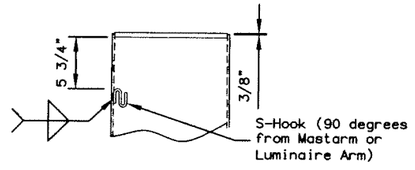


RAIN CAP DETAIL



LOWER SECTION POST TOP

NTS

REVISIONS		
Date	Description	By

SHEET 2 OF 2

State of Alaska
Department of Transportation
& Public Facilities

SIGNAL POLE
WITH 55' TO 65' MASTARM,
UPPER SECTION

APPROVED
STATE OF ALASKA 49TH
Charles W. Wagner
CE 11155
REGISTERED PROFESSIONAL ENGINEER

Date 05/31/12

T-56.00 Sheet 2 of 2

T-57.00

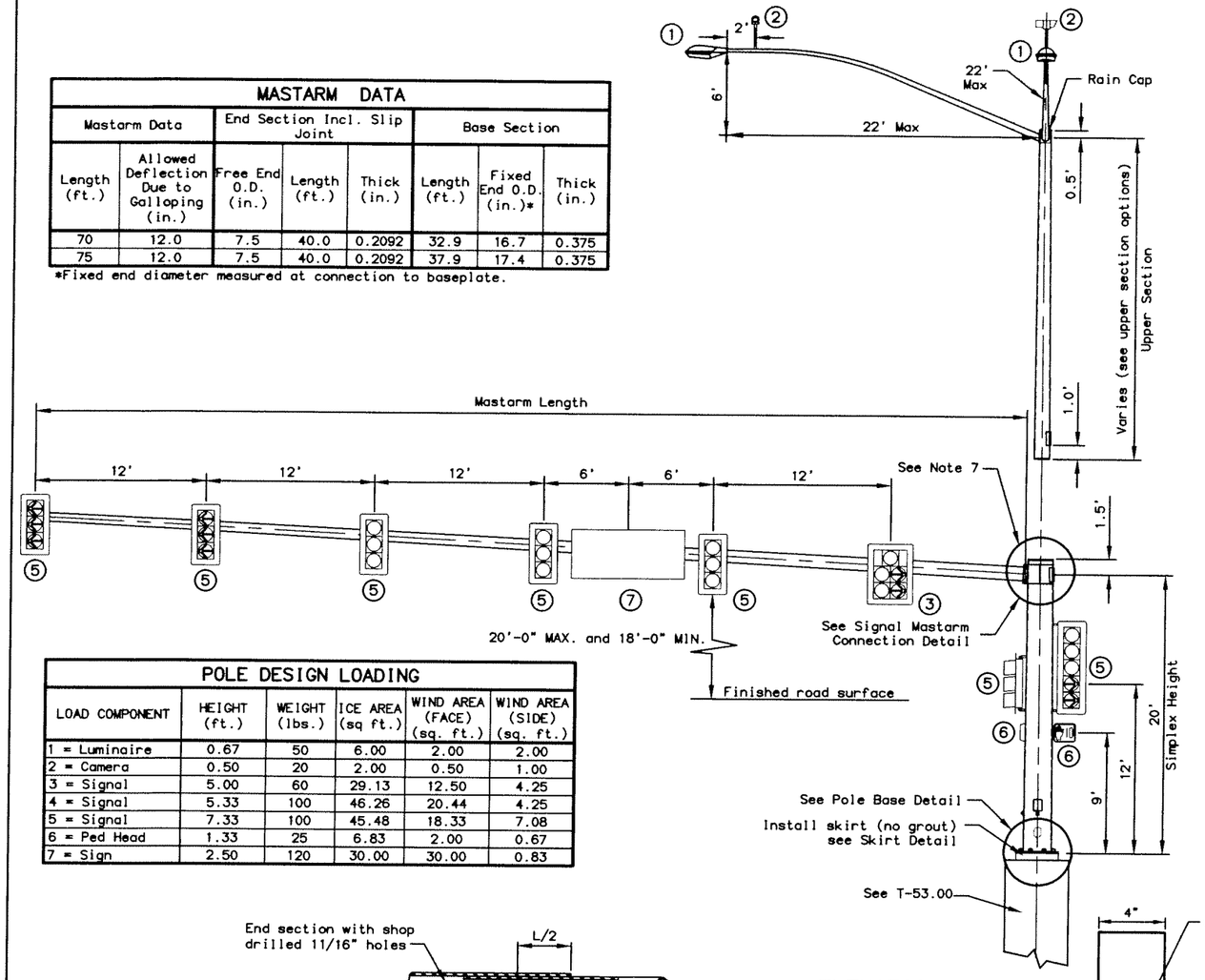
MASTARM DATA

Mastarm Data		End Section Incl. Slip Joint			Base Section		
Length (ft.)	Allowed Deflection Due to Galloping (in.)	Free End O.D. (in.)	Length (ft.)	Thick (in.)	Length (ft.)	Fixed End O.D. (in.)*	Thick (in.)
70	12.0	7.5	40.0	0.2092	32.9	16.7	0.375
75	12.0	7.5	40.0	0.2092	37.9	17.4	0.375

*Fixed end diameter measured at connection to baseplate.

POLE DESIGN LOADING

LOAD COMPONENT	HEIGHT (ft.)	WEIGHT (lbs.)	ICE AREA (sq ft.)	WIND AREA (FACE) (sq. ft.)	WIND AREA (SIDE) (sq. ft.)
1 = Luminaire	0.67	50	6.00	2.00	2.00
2 = Camera	0.50	20	2.00	0.50	1.00
3 = Signal	5.00	60	29.13	12.50	4.25
4 = Signal	5.33	100	46.26	20.44	4.25
5 = Signal	7.33	100	45.48	18.33	7.08
6 = Ped Head	1.33	25	6.83	2.00	0.67
7 = Sign	2.50	120	30.00	30.00	0.83



ELEVATION VIEW
NTS

MATERIAL REQUIREMENTS

ALL ASSEMBLIES	
Steel Through 1/2" Thick	ASTM A572 or A595
Steel Over 1/2" Thick	AASHTO M270 F3 (50ksi)
Finish	AASHTO M111 & M232
Mastarm Bolts	AASHTO M164
Anchor Rods	See T-53.00

POLE (LOWER SECTION)	
Design Length	21.5'
Section Shape	Round
Simplex Height	20'
Fixed End Diameter	21" O.D.
Taper	0.14"/ft
Tube Thickness	0.375"
Base Plate	36" O.D. X 2.25"
Bolt Circle	30"
Signal Arm Plate	26" X 26" X 2.25"
Top Ring Thickness	0.375"
Bottom Ring Thickness	0.375"
Gusset Plate Thickness	0.375"
Handhole Cover Thickness	10 ga
Pole Skirt Thickness	10 ga

MASTARM	
Design Length	75'
Section Shape	Round
Taper	0.14"/ft
Tube Thickness	Mastarm Data
Mastarm Rise	3.0 Degrees
Base Plate	26" X 26" X 2.25"
Bolt Circle	8 Vertical O.C.
Mastarm Bolts	1.5" X 4.5"

NOTES:

1. Provide pole assemblies meeting the following design criteria; 2001 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, the latest edition of the Alaska Standard Specifications for Highway Construction including Standard Modifications and, Special Provisions. Design for a basic wind speed of 100 mph, Fatigue Category III, with galloping. Measure allowed deflection due to galloping at the free end of mastarm.
2. Provide poles to accommodate the maximum length shown in the Mastarm Data with the given loads, dimensions and material requirements.
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   - Not more than 4 traffic signals and/or signs are attached to the end section of the mastarm.

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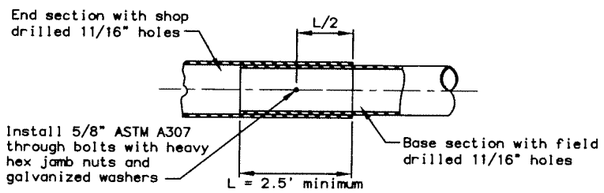
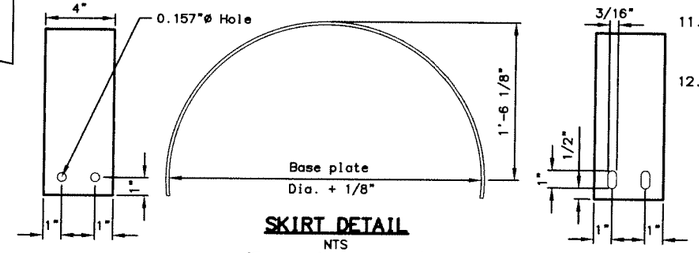
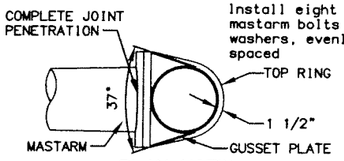
4. The manufacturer is to determine weld sizes. All welds and testing shall conform to the latest edition of the Structural Welding Code AWS D1.1. Provide visual test (VT) of 100% of all welds. Provide magnetic particle test (MT) of 100% of all fillet welds. Provide Radiographic (RT) or ultrasonic test (UT) of 100% of all complete joint penetration welds and a random 25% of all partial joint penetration longitudinal seam welds.
5. Fabricate pole tubes from no more than 2 pieces of steel. When using 2 pieces, place the longitudinal welded seams directly opposite one another.
6. Fabricate luminaire arms and connections according to Standard Drawing L-03.10.
7. Provide permanent tags on all pole sections per Section 740 Table 740-1 of the Specifications. Provide a rain cap when no upper section is specified.
8. The Department will reject damaged or defective poles for any of the following; variances from approved shop drawings, variances from material requirements, sections more than 2-percent out of round, sections bowed more than 1-inch throughout the length of the pole, mastarm, or segment and, damaged or dented finishes.
9. Drill a 1" maximum diameter hole at each traffic signal location. Orient the hole on the horizontal axis of mastarms.
10. Install pole plumb by ensuring the side opposite the mastarm is vertical in its final deflected position.
11. Align welded seams on adjacent sections of mastarms to form continuous straight seams the length of the mastarm. Mechanically force mastarm sections together for a snug fit.
12. Clean and remove dirt, burrs, mill scale, and excess galvanization on all faying surfaces and threaded parts before assembly. Lubricate the threads of all bolts and nuts with lubricant containing a visible dye. Tighten all bolts according to section 504 of the specifications.



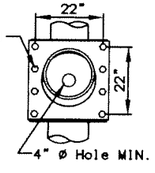
MASTARM SLIP SPLICE ELEVATION DETAIL
NTS



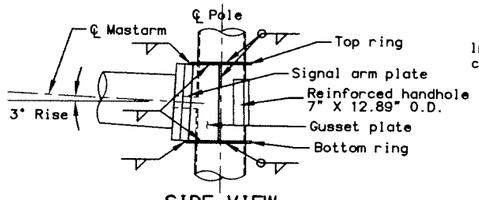
SKIRT DETAIL
NTS
(Two required per pole)



PLAN VIEW

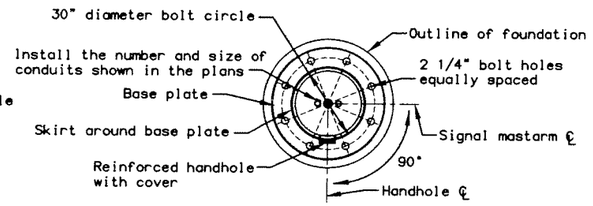


FRONT VIEW

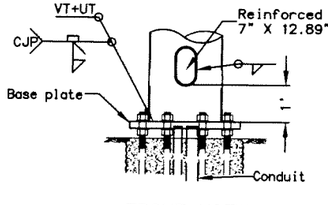


SIDE VIEW

SIGNAL MASTARM CONNECTION DETAIL
NTS
(Elevation view of a ring stiffened built-up box)



PLAN VIEW
(Shown without anchor bolts and nuts for clarity)



FRONT VIEW
(Skirt omitted for clarity)

POLE BASE DETAIL
NTS

REVISIONS		
Date	Description	By

SHEET 1 OF 2

State of Alaska
Department of Transportation & Public Facilities

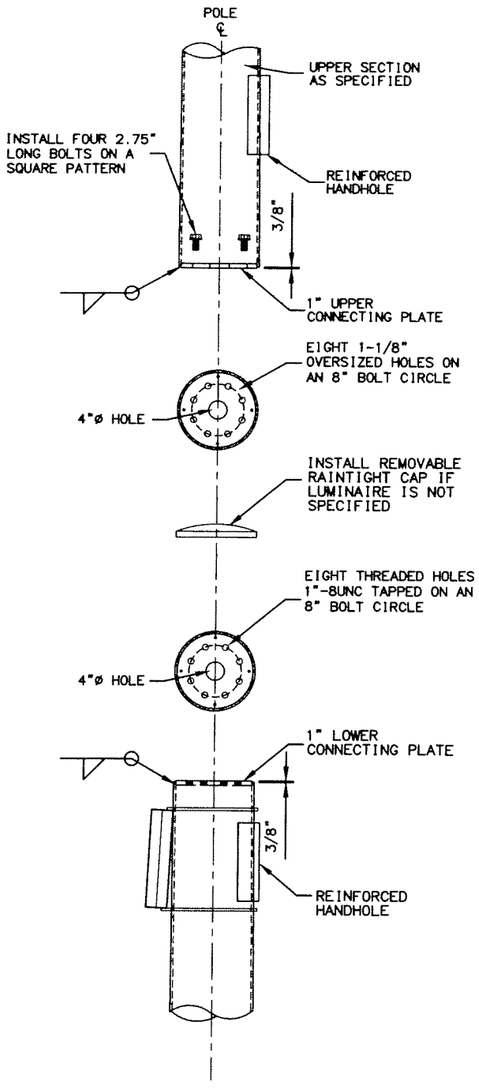
SIGNAL POLE
WITH 70' TO 75' MASTARM,
LOWER SECTION

APPROVED
STATE OF ALASKA 49TH
Charles M. Wagner CE 11155
REGISTERED PROFESSIONAL ENGINEER

Date 05/31/12

T-57.00 Sheet 1 of 2

T-57.00



POLE CONNECTING DETAIL

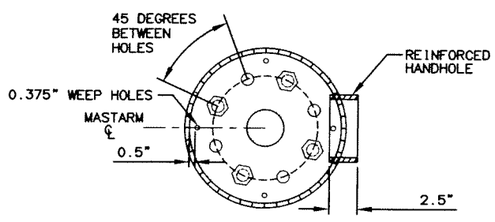
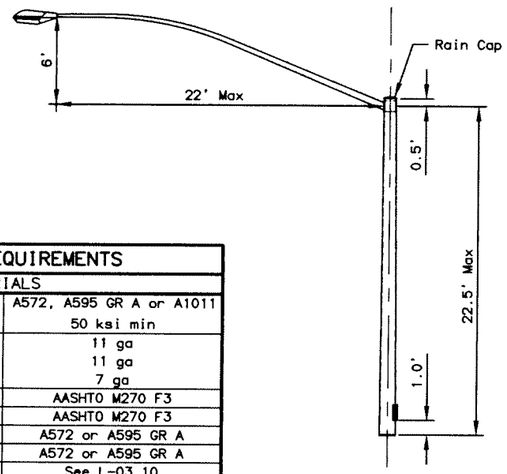
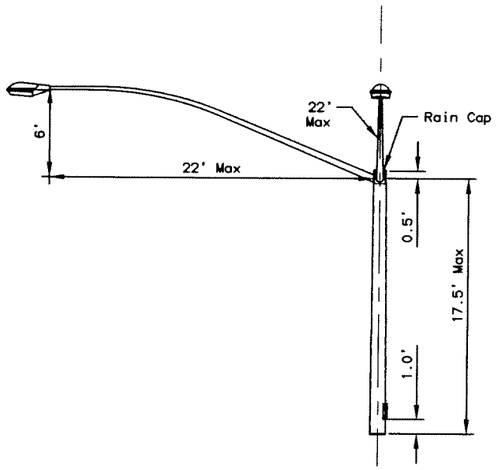


PLATE DETAILS

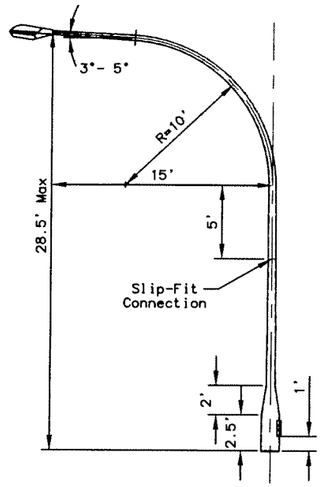
MATERIAL REQUIREMENTS	
MATERIALS	
Tube Material	A572, A595 GR A or A1011 50 ksi min
Single Luminaire Tube	11 ga
Double Luminaire Tube	11 ga
Davit Luminaire Tube	7 ga
Lower Connecting Plate	AASHTO M270 F3
Upper Connecting Plate	AASHTO M270 F3
Concentric Reducer	A572 or A595 GR A
Connection Tube	A572 or A595 GR A
Luminaire Arm Materials	See L-03.10
Upper Section Attachment Bolts	1"-8UNC / AASHTO M164
Luminaire Attachment Bolts	3/4"-10 / AASHTO M164
Slip-fit Through Bolt	5/8" / AASHTO M164
Finish	AASHTO M111 & M232
Handhole	7" X 12.89" O.D.
SINGLE LUMINAIRE	
Design Length	22.5'
Section Shape	Round
Fixed End Diameter	17.99" O.D.
Taper	0.14"/ft
Luminaire Arm Details	See L-03.10
DOUBLE LUMINAIRE	
Design Length	17.5'
Section Shape	Round
Fixed End Diameter	17.99" O.D.
Taper	0.14"/ft
Luminaire Arm Details	See L-03.10
DAVIT LUMINAIRE ARM	
Design Height	28.5'
Design Offset	15'
Radius	10'
Section Shape	Round
Fixed End Diameter	17.99" O.D.
Free End Diameter	2.375" O.D.
Taper	0.14"/ft
Concentric Reducer	7 ga
Connection Tube	7 ga



SINGLE LUMINAIRE

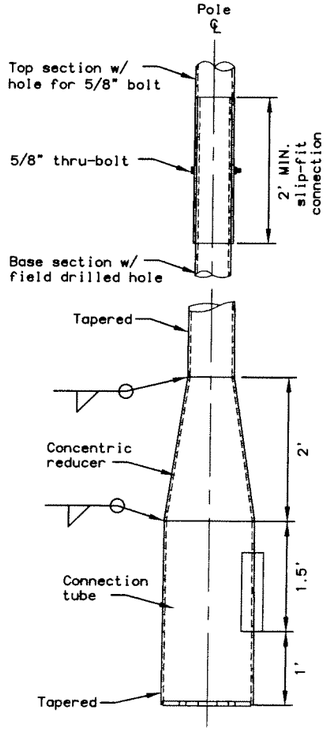


DOUBLE LUMINAIRE

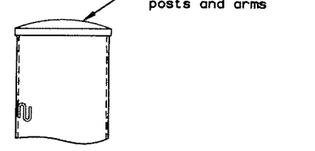


DAVIT LUMINAIRE

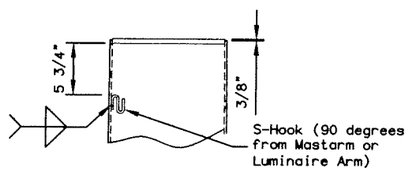
UPPER SECTION OPTIONS
NTS



DAVIT CONNECTION DETAIL
NTS



RAIN CAP DETAIL



LOWER SECTION POST TOP
NTS

REVISIONS		
Date	Description	By

SHEET 2 OF 2

State of Alaska
Department of Transportation
& Public Facilities

SIGNAL POLE
WITH 70' TO 75' MASTARM,
UPPER SECTION

APPROVED
STATE OF ALASKA 49TH
Charles M. Wagner
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T-57.00 Sheet 2 of 2